Inside Political Parties:
Factions, Party Organization and Electoral Competition

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Abstract

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How do parties organize, and do parties' organizational differences matter? Different organization patterns are empirically associated with varying electoral performance, voters' participation, policy-making, and party systems' shape and stability. Despite the empirical relevance of party organization, theoretical scholarship has overwhelmingly focused on other functions of parties — namely the electoral one, simplifying the political world for voters, and the policy-making one in the legislative arena. The papers in this dissertation advance a new theoretical agenda on the organization of political parties, generating insights that I test with novel data. The main contribution of the dissertation is to treat party organization as an endogenous rather than exogenous variable. This approach allows to generate novel insights on how the electoral environment influences the way parties organize, and outcomes such as parties' electoral performance and the process of party system stabilization.

The first paper conceives the internal organization of a party as being driven by factional competition. What brings opposing factions to engage in sabotage rather than enhance the party image, and what strategies can parties adopt to contain it? The paper introduces a model of elections in which intra-party factions can devote resources to campaign for the party or to undermine each other and obtain more power. The party redistributes electoral spoils among factions to motivate their investment in campaigning activities. The model shows that sabotage increases when the stakes of the election are

low — e.g., in consensus democracies that grant power to the losing party — because the incentives to focus on the fight for internal power increase. It also suggests that the optimal party strategy for winning the election in the face of intra-party competition is to reward factions with high powered incentives when campaigning effort can be easily monitored, but treat factions equally otherwise. Finally, the model shows that, when a party weakens electorally, factions' incentives move from campaigning for the party to sabotaging each other to obtain electoral spoils. A testable implication of this result is the emergence of political scandals triggered internally as a product of factional sabotage.

The second paper tests this empirical implication using original data on judicial investigations of Italian MPs involved in various misbehaviors. Judicial investigations of politicians are a fundamental component of politics, often leading to scandals. Yet, empirical evidence of the strategic determinants of judicial investigations is intrinsically hard to gather, a problem that has significantly limited the study of this important phenomenon. The paper studies the politics behind judicial investigations leveraging new data on prosecutors' informants in 1125 episodes of misbehavior of Italian MPs involved in different crimes (1983-2019). Results provide evidence in favor of a political use of denunciations for corruption crimes: when a party weakens, the likelihood that political enemies denounce past misbehavior of members of the weakened party increases, suggesting that the political use of denunciation is elastic to changes in the electoral performance. The timing of past misbehavior is crucial: members of weakened parties are more likely to be accused of misbehavior that happened a long time before the accusation, which further supports the conjecture that accusations are politically motivated.

The third paper moves to the topic of party organization in the presence of multiparty competition. It conceives of the choice over party organization as parties' decision to form different types of alliances. Despite being pervasive, little is known about the conditions facilitating different forms of pre-electoral alliances. The paper presents a model

of electoral competition in which parties can form alliances before elections, and decide how binding these should be. Parties face a dynamic trade-off between insuring themselves against large shifts in public opinion and allowing flexibility to respond to future changes in voters' preferences. The model shows that more binding alliances such as mergers emerge in equilibrium when electoral volatility is high; otherwise, parties form more flexible pre-electoral coalitions. It also suggests that some power concentration is needed for alliances to emerge in equilibrium, whereas parties run alone under consensual democracies that share power among all parties.

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Chapter 1: Introduction

"As institutions, parties enjoy a general disrepute, yet most of the democratic world finds them indispensable as instruments of self-government, as means for the organization and expression of competing viewpoints on public policy."

– V.O. Key, *Southern Politics In State and Nation.*

Political parties serve three main functions (Key, 1955): the first one is in the electorate, simplifying voters' electoral choice and generating symbolic loyalties. The second function is in office, where parties create and organize government majorities, implement policies and organize dissent. The third function relates to parties as organizations: how leaders are recruited for offices, how interests are articulated and aggregated, and all the activities that create the formal structure of political parties.

Theoretical scholarship has generally focused on parties in the electorate and in government at the expense of parties' organization, especially outside the legislative field. However, recently growing empirical work has highlighted variation across countries and over time in the way parties organize (e.g., candidate selection, factions' formal recognition, party's decision-making processes, mergers), linking party organization to outcomes such as electoral success and voter participation.

In light of this evidence, it is important to analyze the determinants of parties' strategic decisions of adopting different organizational changes, which is precisely what this dissertation is concerned with. As the theoretical chapters of the dissertation will show in detail, treating party organization as an endogenous variable allows to reach a better understanding of the effects of various institutional changes. For example, the first paper

studies how different portfolio allocation rules affect factions' incentives to sabotage each other in a given party, and how changes in electoral institutions affect such incentives. Ignoring how institutional changes condition the choice over different allocation rules could lead to reach empirically biased conclusions.

Throughout the following chapters, I develop a novel theoretical framework to study how parties organize. This setting motivates a large set of unanswered questions. For example, when should we expect parties' rules to foster cooperation, and when to allow internal competition? What are the consequences of parties' organization choices for electoral competition, policy outcomes, and party system stability? Together, the papers in this dissertation advance an agenda on the organization of political parties which produces substantively important implications for outcomes such as intra-party politics, electoral competition, and policy implementation.

The main methodological contribution of the dissertation is to consider the way parties organize as an endogenous variable, rather than exogenous as is typically done in the literature (with few exceptions, that will be discussed in more detail in the subsequent chapters). I do so with three papers: the first ("Electoral Competition and Factional Sabotage") proposes a model of electoral competition to analyze how *intra-party* organizational choices affect the incentives of actors operating within the party. The second paper ("Politics by Denunciation") uses novel data from Italy to test the empirical implications of the first. The third paper of the dissertation ("Does Electoral Volatility Beget Strong Alliances?") moves to the question of alliances in multi-party systems. The paper analyzes a model of *inter-party* organizational choice, where parties can form pre-electoral coalitions and merge into new political entities, to argue that different organizations crucially depend on factors of the electoral environment such as electoral volatility and institutional power sharing. The remainder of this introduction highlights the methodological and substantive contributions of the dissertation.

1.1 A Novel Framework of Intra-Party Organizational Choice

Despite the lack of a clear definition in the literature, the term "party organization" typically alludes to the organizational structure implemented by a party from the bottom to the top — i.e., from its members, factions and currents, all the way to its leadership — and to the way these structures interact with each other (Duverger, 1959).

A recently growing literature has brought attention to the study of party organization. In particular, several empirical studies have emphasized patterns in the way parties organize across countries and over time (Katz and Mair, 1994, Poguntke et al., 2016, Scarrow, Webb and Poguntke, 2017). This variation in party organization is empirically associated with several outcomes of interest. The rules for candidates' selection, whether factions are formally recognized within parties, the centralization of parties' decision-making processes and party mergers are linked to outcomes such as parties' electoral performance, voters' participation, policy-making and the shape and stability of party systems.

As the next chapter presents more in depth, the literature has also analyzed the effect of different configurations of party organization on portfolio allocation among party factions in countries with highly factionalized parties such as Italy (Mershon, 2001*b*,*a*, Ceron, 2014) and Japan (Leiserson, 1968, Ono, 2012). The common trait of these papers is that they all consider party organization as exogenous. However, the evidence connecting party organization to crucial electoral outcomes warns us against considering party organization as an exogenous variable. Rather, it motivates researchers to treat it as an endogenous variable decided by strategic actors. In this dissertation, I propose a formal framework to study intra-party organizational choices that considers parties' strategic decisions of adopting organizational changes to achieve electoral success.

The framework allows to study which conditions of the electoral environment (e.g., political institutions, polarization) trigger different organizational choices, and how these

affect parties' electoral performance. The internal organization of a party shapes the behavior of the actors operating within it. Disregarding how features of the electoral environment feed back into parties' internal organization can lead to empirically understate the consequence of institutional changes.

I develop this framework in the first paper, "Electoral Competition and Factional Sabotage," which proposes a model of electoral competition where parties are internally divided into factions that compete over rents and ideological positioning. A party's internal organization is conceptualized as the way factions are organized given the competitive environment in which the party operates. That is, parties change their internal organization by promising factions different rewards depending on whether the party wins or loses the election.

The model conceives a party's internal organization as being driven by factional logics, taking a stance against the unitary actor assumption that characterizes most formal work in political science. Factions have always been an essential component of political parties, and critical for determining their internal organization. Party members differ in their views on party strategy and policy preferences. Since individual members are typically not able to gain control over the party, factions emerge as a way for individuals with similar preferences and goals to gain influence over internal decision-making.

This process then generates a public good provision problem within the party. On the one hand, factions need to cooperate and work together for the party in order to win elections and obtain electoral spoils. On the other, factions face the temptation to free-ride on this public good provision, and fight each other to gain a larger share of the spoils. Parties take into account factions' incentives, and design their internal institutions to maximize their electoral goals.

What strategies do parties typically adopt to motivate factions? The first paper presents the case of the Italian Christian Democratic Party (DC) and the Japanese Liberal Demo-

cratic Party (LDP), historically identified as the most stable factionalized parties across democratic systems. In both examples, factions' relative power determined the distribution of electoral spoils, the main driver of factional action. In the DC case, the spoils allocation method followed an explicit formula according to which cabinet positions were distributed among factions in proportion to the number of party members each faction had (Venditti, 2016). The allocation of cabinet positions in the LDP consisted of dividing the electoral spoils proportionally among factions and giving a premium to the largest factions (Browne and Kim, 2003, Ramseyer and Rosenbluth, 2009).

Motivated by this evidence, I formalize party organization by analyzing different incentive schemes that reward factions' electoral campaigning effort. The model studies how different forms of party organization affect factions' incentives to sabotage each other. Furthermore, the model allows to study how changes in the electoral environment affect the equilibrium party organization and, in turn, factions' incentives. Such changes might be institutional (e.g., electoral reforms) or non-institutional (e.g., an increase in ideological polarization), and have implications that I discuss in what follows.

1.2 The Electoral Environment: Power Sharing and Ideological Polarization

The framework presented in the first paper allows to study several questions of interest. In the model, factions decide how much to invest in campaigning activities to support the party — e.g., constituency service that increases party valence —, and how much to sabotage each other to obtain more power within the party. The model then focuses on what external conditions facilitate or prevent factional sabotage, which widely affects most parties.

One set of results show that factional sabotage varies with inter-party power-sharing. In equilibrium, factions work more for the party as the political system resembles a majoritarian democracy (that is, as inter-party power-sharing decreases). Conversely, the

more the system reflects a consensus democracy, granting power to the losing party, the more factions sabotage each other, as the incentives to focus on the intra-party contest increase. Several constitutional design scholars warn against certain features of winner-take-all electoral systems (Tsebelis, 1995, Powell Jr, 2000, Golder and Ferland, 2017). The model suggests to consider the overlooked element of intra-party incentives generated by institutions when comparing different democratic systems.

Results also show how the organization of a party and factions' behavior are affected by opposing parties, and by party ideological polarization. An increase in polarization corresponds in the model to an increase in the level of divergence between two competing parties' platforms. As polarization increases, I find that factions in both parties campaign more for the party: this is because polarization raises the electoral stakes (the cost of electoral defeat), thus increasing factions' incentives to work for the party and reducing intra-party sabotage.

However, when one of the parties has an electoral advantage given by its platform's proximity to the median voter's preferences, an increase in polarization affects differently the more moderate (advantaged) and the more extreme (trailing) party. In particular, factions in the moderate party campaign more than those in the more extreme party, which engage more in sabotaging activities. Thus, the model suggests that — in the presence of electoral imbalance — intra-party competition should be more severe in trailing parties and when parties weaken electorally, a proposition tested in the second paper of the dissertation ("Politics by Denunciation") with novel data from Italy.

The theoretical analysis of the first paper leaves unanswered several questions concerning the optimal internal organization parties should adopt. Because the model analyses a general equilibrium where two strategic parties (and factions within parties) best respond to each other's party organization, several simplifying assumptions on the latter are warranted. In particular, the model assumes that factions' participation constraints

are always satisfied and that parties choose among a set of anonymous incentive schemes — i.e., the rewards offered to factions do not depend on the faction's identity.

In a related paper not included in this thesis, "Power Sharing, Mobilization, and Party Organization," with Carlo Prato, we consider a broader set of incentive schemes parties can choose from, and analyze how parties' optimal internal organization changes with the electoral environment. A party organization determines the degree of intra-party power sharing, which can be empirically measured with indicators such as leadership autonomy or candidate selection's centralization.

The paper identifies conditions under which winner-take-all institutional settings produce egalitarian internal party organizations, thus documenting an inverse relationship between inter-party power sharing and intra-party power sharing. This result, we show, only holds for parties with low baseline electoral strength, and it implies that we should expect larger parties to have, *ceteris paribus*, less internal power sharing. This is consistent with empirical evidence documenting that leadership positions in larger parties (both in terms of members and legislators) display higher autonomy (Poguntke et al., 2016).

Another implication of the model is that, averaging across parties within the same political system, intra-party power sharing should be higher in systems with lower inter-party power sharing. These systems are characterized by institutions such as disproportional electoral rules, weak legislative checks on the executive (no confidence requirement), no separation of origin between executive and legislative, and simple majority requirements (as opposite to super-majority) for the adoption of key legislative decisions.

1.3 Testing Predictions with Novel Data: the Italian Party System

The model in the first paper predicts that, when a party weakens electorally, factions' incentives move from campaigning for the party to sabotaging each other to obtain a higher share of the party's electoral spoils. A testable implication of this result is the emergence

of political scandals triggered internally as a product of factional sabotage. Besides resulting from the opposition's attacks, political scandals can emerge as a consequence of intra-party competition, where party insiders leak information on copartisans' misdeeds in order to gain power within the party. If factional competition can trigger the outbreak of scandals, then the model suggests that these are more likely to emerge when parties weaken, as factions are engaged in a contest for power.

I test this implication in the second paper of my dissertation, "Politics by Denunciation," with Andrea Ceron, where we study political scandals through their denunciation using original data on judicial investigation of Italian MPs involved in various misbehaviors. The paper provides novel evidence that political enemies can strategically trigger judicial investigations of MPs.

Judicial prosecution of politicians constitutes a prominent source of political scandals. While the opinion that political enemies initiate judicial investigations (typically by leaking crucial information) is popular, empirical evidence is intrinsically hard to gather. Data on judicial investigations is often limited to whether an investigation took place or not, and whether it ended in a conviction. As for political enemies, typically what is observable is their reaction to the investigation, for example through public statements condemning the investigated politician.

We take advantage of a unique source of data on political corruption to study the political nature of judicial investigations. We hypothesize that political attacks through investigations depend on the electoral performance of the accused MP's party. These attacks could be initiated by members of opposing factions within the same party who seek opportunities to achieve more power through internal sabotage, as implied by the first paper. Alternatively, it could be that members of opposing parties use investigations for their political gain, either because they benefit from replacing the attacked MP with an ally, or because they benefit from weakening the opposing party's reputation.

Italy represents an unparalleled opportunity to study the politics behind judicial investigations for several reasons. First, the high number of parties (on average, ten for each legislation) and factions (on average, three for each party). Second, the high number of general elections held in the period covered. Third, and most importantly, the rich details included in the investigation documents. Our dataset is composed of 1125 "requests to proceed" with an investigation against an MP sent by public prosecutor offices to the Chamber of Deputies from 1983 to 2019. The uniqueness of the data we collected lies in the revelation of the source (or whistle-blower) — often another politician — behind the investigation, thanks to which we can provide evidence in favor of a political use of denunciations. Among the RAPs in our dataset, 398 specify in the official document that the whistle-blower is another politician or a member of a political organization or association.

A recent literature has tried to understand the strategic determinants of political scandals. The second paper contributes to the literature by providing the first existing dataset that investigates politically-driven denunciations where the identity of political whistleblowers is known. This allows to trace the political process underlying judicial investigations of politicians, which typically lead to scandals.

In line with our hypothesis, we find that the use of denunciation is elastic to changes in the electoral odds: MPs whose parties weaken electorally are more likely to suffer scandals that are initiated by political enemies.

More broadly, the evidence in the second paper allows us to derive some insights on the sustainability of party systems. The loss of popularity of mainstream Italian parties made (political and non-political) investigations possible, which in turn resulted in the dissolution of the existing party system. Judicial activity investigating MPs became a salient issue after 1992, when the Mani Pulite (Clean Hands) judicial inquiry shed light on the illegal links between politics and business and revealed the political corruption permeating the political system, which resulted in the Tangentopoli corruption scandal

and in the end of the First Republic.

A widely shared view is that the endeavor undertook by the Italian public prosecutors was only possible because of the profound crisis that affected the dominant political parties of the First Republic.[1] Indeed, the Italian political system started to face broad transformations in the 1980s. After decades of party system stability and dominance of the Christian Democracy, new cleavages transformed the political space, opening opportunities for new populist parties such as the Northern League which partially originated as a reaction to the "cartelization" that characterized the First Republic. The Tangentopoli investigation and the resulting crisis of the Italian party system would not have been possible in the previous balance of power that characterized parties in most of the First Republic.

1.4 From Intra-Party to Inter-Party Organization Choice

Most of the empirically documented dispersion in parties' organization structure takes place in multi-party systems. When elections involve more than two parties, forming electoral alliances becomes a fundamental aspect of party organization. Empirically, most multi-party systems are extremely "liquid" (Powell Jr, 2000, Golder and Ferland, 2017): parties form and leave temporary coalitions at all times. The two main right-wing Spanish parties recently formed a pre-electoral coalition before the 2020 regional Basque Country elections to prevent the division of the right-wing vote and avoid the Socialist Party's majority. Similarly, recent evidence from Mexican and Finnish local elections shows that parties form pre-electoral alliances to remove entrenched incumbent parties from office (Frey, López-Moctezuma and Montero, 2021, Hortala-Vallve, Meriläinen and Tukiainen, 2021).

[1] Cf. Andrea Pamparana's documentary, *'Mani Pulite'*, which provides a collection of interviews of several influential sources connected to the investigations and the political events of those years.

Besides forming temporary coalitions, parties also merge into new entities. The merger between the Progressive-Conservative (PC) and the Canadian Alliance parties in 2003 created a new right-wing formation that altered the Canadian party system. The Italian political landscape completely changed in 2007, when mergers occurred across the entire ideological spectrum. The first merger occurred within the Left between April and October 2007, when the *Democratici di Sinistra* — the largest of the successor parties of the former *Partito Comunista Italiano* — merged with *La Margherita* to form the Democratic Party (PD). A few months later, Berlusconi's *Forza Italia* merged with the right-wing *Alleanza Nazionale* to form the *Popolo della Libertà* in November. These movements affect parties' electoral success and the stability of party systems.

Despite the evidence showing that parties across the world are increasingly seen to join forces *before* election — adopting various governance configurations — the existing theoretical literature essentially treats political parties as fixed. This is unfortunate, as understanding different forms of inter-party cooperation is crucial for anticipating how party systems might develop.

In the third paper of the dissertation, "Does Electoral Volatility Beget Strong Alliances? A Theory of Multi-Party Competition," I present a model of electoral competition in which parties can form alliances before elections. The choice over party organization is formalized with parties' decision of forming different types of alliances. Parties can join flexible alliances, such as pre-electoral coalitions (PECs) which allow them to keep their separate identities, or more binding ones such as mergers, whereby constituent parties form new political entities.

This framework allows to study which conditions of the electoral environment (e.g., electoral volatility, power sharing institutions) trigger different organizational choices, and how these affect parties' electoral performance. The main intuition of the model is that parties' organizational choice over different forms of alliances crucially depends on

electoral volatility, which reflects the extent to which voters' preferences change between subsequent elections.

The fundamental trade-off that parties face in the model is dynamic. On the one hand, mergers insure constituent parties against unfavorable shifts in the electorate's preferences, while at the cost of losing the opportunity to join more advantageous coalitions in the future. On the other, alliances that allow parties to maintain their identity offer flexibility to respond to future changes in voters' preferences.

Intuitively, the model shows that when electoral volatility is low enough (e.g., when voters are highly partisan), in equilibrium parties form flexible alliances such as PECs. Conversely, as voters' preferences become more volatile, parties choose to form strong alliances such as mergers. This result is in line with the empirical observation that mergers are more likely to form in the early years of democratic regimes, which are characterized by electoral instability (Kitschelt et al., 1999, Ibenskas and Sikk, 2017).

Results also show how this central trade-off varies with inter-party power sharing (Lijphart, 1984). In particular, at least some degree of power concentration is needed to trigger mergers and pre-electoral coalitions. Intuitively, under consensual democracies that share power among all parties, minority parties do not need to join pre-electoral alliances to have their voices heard in the policy-making process. However, as power gets increasingly concentrated in the hands of the winner of the election, parties need to join forces and both PECs and mergers can emerge in equilibrium. Examples of a decrease in power sharing are changes in the electoral system (e.g., from proportional to winner-take-all), or institutional changes holding fixed the electoral system's proportionality (e.g., from legislative-executive balance to executive dominance).

Finally, the third paper provides novel insights for the study of party system stability. The literature has often linked electoral volatility to unstable party systems, and several studies even use measures of electoral volatility as an indicator of party system instabil-

ity (for an overview, see Tavits, 2008). However, by assuming that a volatile electorate is responsible for system instability, this approach overlooks endogenous changes in party organization as a reaction to electoral volatility. Similarly to the theoretical framework introduced in the first paper, this model suggests to take into account parties' strategic organizational choices to avoid omitted variable bias when evaluating the relation between electoral volatility and party system stability.

1.5 Gathering Takeaways

The main methodological contribution of this dissertation is to analyze party organization as an endogenous response of strategic actors to the electoral environment in which they operate. This approach generates substantively important insights that can be summarized as follows.

First, various theoretical results in the dissertation highlight the importance of considering variation in party organization in the study of institutional change, and in particular of institutional power sharing. For instance, consider an increase in inter-party power sharing. The model in the first paper shows that such an increase leads to less cooperative factions that sabotage each other more. Such a change might also lead to more centralized internal party organizations, highlighting an inverse relation between inter-party and intra-party power sharing institutions. Furthermore, the third paper shows that, when moving to organizational choices across parties, an increase in power sharing can deter the formation of pre-electoral alliances.

Second, the papers in this dissertation contribute to our understanding of party system stability. The first paper shows that factional competition should increase as parties weaken electorally. This finding is consistent with the high levels of intra-party competition, and resulting corruption scandals, which doomed the Christian Democratic party and contributed to end the Italian First Republic. It is also consistent with the evidence

in the second paper showing that weakening parties induce politicians to engage in politics by denunciation, triggering the dissolution of the existing party system. Finally, the third paper provides novel insights and implications for the process of party system stabilization. Binding alliances such as mergers can reduce excessive party system fragmentation by forming parties that are stable in time. By considering how factors such as electoral volatility and institutional power sharing affect the formation of mergers and pre-electoral coalitions, the paper suggests when to expect a party system to stabilize.

Chapter 2: Electoral Competition and Factional Sabotage

Sabotage is an undeniable fact of party life. Examples abound across different times and places. Intra-party sabotage permeated one of the most highly factionalized parties of all times, the Christian Democratic party (DC) that ruled Italy from the aftermath of World War II until the 1990s, contributing to its demise in 1994.[1] This intense factional competition constituted a fundamental root of the corruption that caused the end of the Italian "First Republic" (Golden and Chang, 2001). More recently, a leaked internal report provided evidence of factionalism and sabotage that took place during Jeremy Corbyn's four-year tenure as leader of the Labour Party.[2] In the wake of the evidence, several members of Corbyn's faction maintained that the party would have won in 2017 absent sabotage.[3]

Democracy works differently in the presence of factional competition than in the absence. Warring factions take away resources that parties can otherwise devote to electoral competition, thereby affecting electoral results and final policy outcomes.[4] Despite the pervasiveness of factional competition across a variety of political systems, little is known about the conditions facilitating sabotage, or the strategies parties adopt to con-

[1] The party imploded as a consequence of "Tangentopoli," one of the biggest corruption scandals of all times (Waters, 1994).

[2] See Mason, R. (2020) 'Hostility to Corbyn curbed Labour efforts to tackle antisemitism, says leaked report,' The Guardian, 12 April. Link to original report: https://cryptome.org/2020/04/Labour-Antisemitism-Report.pdf.

[3] Link to Labour Party MP's tweet: https://twitter.com/RichardBurgon/status/1249461680834256898.

[4] Since the American Founding Fathers, several authors have regarded factions as potentially dangerous. In Federalist 10, Madison outlines the dangers that factionalist interests can pose to political unions (Madison, 1787). Similarly, V. O. Key, as cited in Boucek (2009), blamed factions for encouraging favoritism and graft among elected officials (Key, 1949).

tain it. Identifying these conditions is necessary to understand better political parties, and ultimately the sustainability of political systems. Does an increase in party polarization alleviate or exacerbate factional competition? What are the institutional features of the electoral system that help to promote cooperation among factions? Given factions' incentives, how do party rules change to limit sabotage and foster cooperation?

To answer these questions, the paper introduces factional competition in a model of elections between two parties. The model identifies features of the electoral environment that alleviate intra-party sabotage, and shows how the party organization changes to limit it, thus maximizing the chances of winning the election. Features of the competitive environment such as ideological polarization and electoral institutions affect factions' incentives to sabotage each other instead of mobilizing towards the party's common good. Factions' incentives are taken into account by the party, which changes its organization accordingly.

What strategies can parties adopt to motivate factions? Historically, within both the Italian DC and the Japanese Liberal Democratic Party (LDP) — identified as the most stable factionalized parties across democratic systems (Bettcher, 2005) — factions' relative power determined the distribution of electoral spoils, the main driver of factional action. In the DC case, the spoils allocation method followed an *explicit* formula according to which cabinet positions were distributed among factions in proportion to the number of party members each faction had.[5] Motivated by this evidence, this paper formalizes the concept of party organization by analyzing different incentive schemes that reward the electoral campaigning effort of factions. In the model, factions decide how much to invest in campaigning activities to support the party — e.g., constituency service that increases party valence —, and how much to sabotage each other to obtain more power within the

[5] The method refers to the "Cencelli Manual", which since then became a common political idiom (Venditti, 2016). Section 2.1 illustrates the relevance of the manual, and describes in more detail the Italian and Japanese factions.

party. Sabotage is defined as a range of activities that increase a faction's relative power within the party and produce negative externalities against other factions.

The goal of each party is to win the general election. Party platforms are fixed, and parties incentivize factions to invest in campaigning activities to increase the odds of winning. Each party controls electoral spoils (e.g., cabinet positions, assignment to committees) and distributes them among factions without leaving resources on the table. The share of electoral spoils obtained by each party is determined by the amount of power-sharing of the electoral environment (Lijphart, 1984): majoritarian democracies concentrate power in the hands of the winning parties, while in consensual democracies resources are more evenly shared with minority parties.

Factional investment in campaigning activities is only imperfectly observable. Often parties need to make organizational decisions based on imperfect measures of factional performance (e.g., the party vote share in a given district or the number of members each faction brings to the party). These performance indicators result in an internal ranking of factions, based on which the party distributes electoral spoils. The ranking depends on both campaigning effort and sabotage: the faction ranking higher could be the one that worked more for the party or the one that focused on undermining the other faction.

Different features of the competitive environment might encourage a faction to obtain more power by investing more in sabotage than campaigning effort. To capture which of the two activities is more profitable to achieve a higher internal ranking, the model introduces a parameter representing the relative effectiveness of sabotage to rank higher within the party. This parameter refers to institutional and non-institutional factors that make factions' campaigning effort harder to reward by the party. For instance, having factions tied to electoral strongholds makes it easy for a party to reward campaigning effort, by observing electoral performance in a given area. In this case, campaigning is "more effective" than sabotage in achieving a high ranking. In the absence of such indicators

(for example, when factions overlap geographically), the party might be constrained to rely more on other measures that lend themselves to sabotage, such as the number of members brought to the party by each faction.[6]

To maximize the chances of winning, each party specifies how much of the party's spoils are distributed to factions according to the internal ranking. In line with the empirical evidence, I assume that parties commit to the internal ranking for rewarding factions.[7] The rewards that the party can choose span from low-powered — i.e., both factions are equally rewarded, independently of the ranking indicator — to high-powered — i.e., the faction ranking higher obtains all the party spoils. When campaigning effort is more effective than sabotage to achieve a high ranking, choosing high-powered incentives amounts to reward the faction that probabilistically invested more in campaigning activities, while low-powered incentives discourage campaigning. Conversely, when sabotage is more effective than campaigning activities, high powered incentives encourage sabotage.

The first set of results show that factional sabotage varies with inter-party power-sharing. In equilibrium, factions work more for the party as the political system resembles a majoritarian democracy (that is, as inter-party power-sharing decreases). Conversely, the more the system reflects a consensus democracy, granting power to the losing party, the more factions sabotage each other, as the incentives to focus on the intra-party contest increase. Several constitutional design scholars warn against certain features of winner-take-all electoral systems (Tsebelis, 1995, Powell Jr, 2000, Golder and Ferland, 2017). This result underscores the overlooked element of intra-party incentives generated by institutions when comparing different democratic systems.

Factions' equilibrium behavior changes with ideological polarization as well. I distin-

[6] In order to increase their relative number of party memberships, factions of the Italian Democratic Party used to engage in sabotaging activities such as impeding subscriptions to competing factions.

[7] This assumption closely reflects portfolio allocation in both the Italian DC and the Japanese LDP, as Section 2.1 illustrates.

guish between polarization *across parties* and polarization *across factions* within the same party, and show that the two have different implications. When parties' platforms are distant from each other and the median voter is moderate, factions in the more extreme party sabotage more than those in the moderate party, which instead campaign more to win the election. Intuitively, a higher probability of victory is associated with a higher expected payoff for factions in the moderate party, which invest more resources in campaigning. However, when factions in the same party are ideologically distant, the extreme faction invests more in campaigning than the moderate one. This happens because the stakes of the election are greater for the more extreme faction, which suffers a higher ideological cost from losing than the moderate one, which is ideologically closer to the opposing party. This prediction resonates with the UK Labour party in the 2017 campaign, where Corbyn's faction devoted substantial resources to campaigning for the party, while the moderate Labour MPs engaged in public hostility against Corbyn's faction and its policies.

Given factions' incentives, which rewards does the party choose in equilibrium? Intuitively, when campaigning effort is more effective than sabotage to obtain a high internal ranking, high powered incentives are optimal: the faction with the highest internal ranking obtains more electoral spoils. The method of allocation of cabinet positions in the Japanese Liberal Democratic Party (LDP) before the 1994 electoral reform is consistent with this prediction.[8] Yet, sabotage could be more efficient than campaigning to obtain a high internal ranking in some situations. In the Italian DC case, for instance, it was easier for factions to deny cards to the opposing faction than to bring new members to the party (Venditti, 2016). When this is the case, the party knows that the better-placed faction is the one that (probabilistically) sabotaged more, and in equilibrium incentives

[8] The method consisted in dividing proportionally the electoral spoils among factions and give a premium to the "mainstream faction" with the highest share of votes (Browne and Kim, 2003, Ramseyer and Rosenbluth, 2009).

are low powered.

The model produces several empirical implications on the effect of electoral institutions on intra-party competition. First, it suggests that an increase in inter-party power-sharing can exacerbate competition within parties. Such change might refer to the electoral system (e.g., from winner-take-all to proportional), or an institutional change holding fixed the electoral system's proportionality (e.g., from executive dominance to legislative-executive balance). Second, features of the electoral systems such as the use of preference votes — where voters can indicate a preference for candidates on the ballot — can increase the visibility of factional campaigning effort and its relative effectiveness to rank higher within the party.[9] The literature on personal vote states that the use of preference votes increases intra-party competition at the *individual candidate* level (Carey and Shugart, 1995), although Carroll and Nalepa (2020) show that electoral systems in which parties have less control over member's electoral rank can encourage greater policy agreement. This model suggests that intra-party competition could be reduced at the *factional* level, thus uncovering potential omitted variable bias in the correlation between weak parties and open list PR systems.

This paper provides a novel theoretical framework to understand how factional competition shapes the life of a party — its internal institutions, campaigning capacity, and policy platforms. As such, it relates to the theoretical literature analyzing the role of factions within parties (Persico, Pueblita and Silverman, 2011, Dewan and Squintani, 2016, Izzo, 2018). In addition to providing a new framework for the analysis of intra-party organization, the model advances this literature by studying intra-party sabotage, which empirically is often driven by factional divisions (Zariski, 1965, Brass, 1966, Cox and Rosenbluth, 1994, Mershon, 2001*b*, Balán, 2011, Nellis, 2019).

[9] As argued in Section 2.5, by observing candidates' preference votes the party could condition factions' rewards on the number of preference votes that factions' candidates get. This in turn could incentivize factions to campaign for the party.

While most of the existing theoretical literature on intra-party organization focuses on primaries (e.g., Adams and Merrill, 2008, Serra, 2011, Ting, Hirano and Snyder Jr, 2018), this model conceptualizes a party's internal organization as the degree of *power-sharing* among its factions. As such, the model closely relates to a small theoretical literature studying party organizations alternative to primaries. In a seminar contribution, Caillaud and Tirole (2002) compare primaries to hierarchical internal organizations and study their effect on electoral effectiveness in majoritarian elections; Crutzen, Castanheira and Sahuguet (2010) extend this framework to embed the analysis of intra-party organization into an electoral setting with two parties competing for office. In the context of proportional representation systems, Buisseret et al. (2017) study how political parties structure candidate selection by ranking candidates on lists. I contribute to this literature by formalizing with contract theory tools the agency relation among the central party leadership and factions within parties. Second, I embed this framework in a probabilistic voting model of electoral competition, where electoral imbalance is endogenously provided by intra-party competition among factions.

The remainder of the paper is organized as follows. Section 2.1 provides a historical account of factional dynamics in the Italian Christian Democratic party and the Japanese Liberal Democratic Party. Section 2.2-2.4 describe the model and its results. Section 2.5 proposes some empirical implications and Section 2.6 concludes.

2.1 Portfolio Allocation *Within* Parties: Factions in Italy and Japan

This section provides a brief historical account of the Italian Christian Democratic Party (DC) and the Japanese Liberal Democratic Party (LDP). Both parties based the distribution of cabinet portfolios on factions' relative power: in the DC case, the allocation method followed an explicit rule named *"Cencelli manual"* (Venditti, 2016).

2.1.1 Italian Christian Democratic Party

The Cencelli manual is a weight calculation method invented in 1968 by Massimiliano Cencelli. The method was adopted to calculate how many ministries and undersecretaries the DC would get in the upcoming election, and it was used to assign offices to factions for decades. The calculations of all the governments formed after 1968 are collected in hundreds of pages with factional denominations as they form, break up and recompose, their absolute and percentage weight, the final number of ministries and under secretaries, and finally the names of ministries and under secretaries of all the formed governments.

Figure 2.1, taken from the original manual, provides an illustration of the method.[10] The baseline for calculating a faction's relative weight is given by the percentage of party members belonging to each faction (in the picture, the bars).[11] Based on the percentage obtained, the party assigns cabinet positions to each faction (triangles). Thus, it is clear that factions are incentivized to obtain as many memberships as possible and, as history shows, *by any means.*

The Cencelli Manual reflects the phase of highest internal fractionalization of the DC (the 1960s-70s), with factions fighting each other to obtain more seats (Sartori, 1971). Historical accounts of sabotage inside the party were closely related to the widespread phenomenon of "membership card inflation" (Venditti, 2016), which plagued the party since the 1960s. A common way used to inflate membership cards was to assign memberships to individuals who either were unaware, dead, or had emigrated.[12] Another — perhaps more straightforward — sabotaging technique was to impede subscriptions to competing

[10] The original table is reported in the Appendix.

[11] In the model, this percentage corresponds to the outcome of an internal ranking of factions, which depends on their choice of effort and sabotage.

[12] In 1976, two DC senators revealed that more than 50% of membership cards were false, "corresponding to people who either did not exist or never asked to be members of the party" (Venditti, 2016).

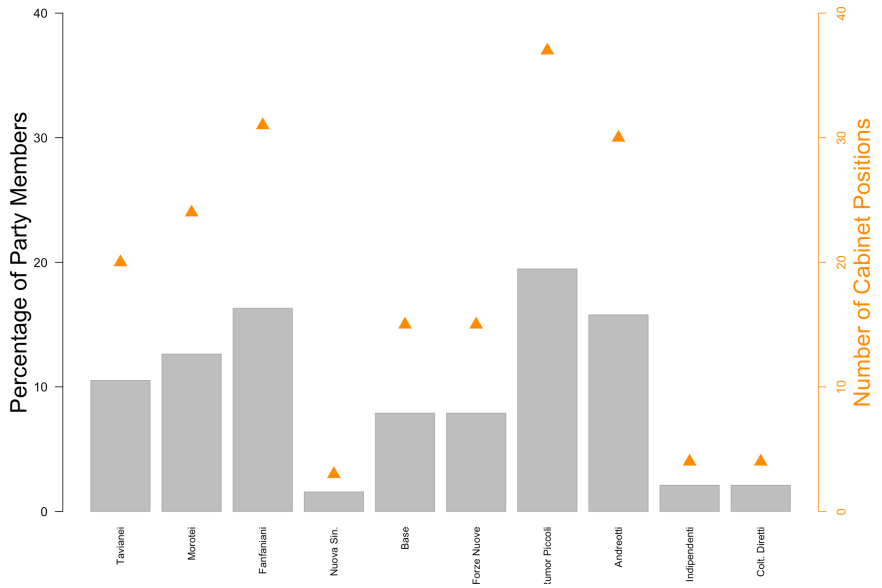

Figure 2.1: **Portfolio Allocation Rule in Italian Christian Democracy (1973).** The bars represent the percentage of party members belonging to each faction composing the DC in 1973. Based on this percentage, the total number of cabinet positions is divided among the party factions. The triangles show the total number of members of each faction obtaining a cabinet position.

factions with delays and procedural complications (Venditti, 2016).[13] These sabotaging activities affected the electoral performance of the DC, which saw its power gradually reduced until the party's demise in 1994.

A critical member of the old faction Dorotea, Giuseppe Zamberletti, defined the manual as "the organization chart of the Christian Democratic company." The party is described as a holding company, where more membership cards have the right to more power, regardless of other factors such as valence, honesty, and administration quality. All the governments closely followed the Cencelli manual in assigning office positions.

[13] To understand how widespread these phenomena were, it is worth looking at what happened in 1976, when the party took two measures: the first forced all party representatives to immediately accept requests of registration to the party, while the second increased the membership fee. Consequently, the DC members that year dropped by 360,000 units (21.2%), and newly registered members increased from 6.1% to 15.1%. This event provides evidence that there was indeed a membership card inflation and many obtained a card that was before denied by competing factions.

If the proportions were not correct (i.e., not following the manual's predictions), the penalized factions would jeopardize the government while officially pretending to be loyal. Indeed, there have been occurrences of *"franchi tiratori"* — MPs voting against the government in secret votes because excluded from power-sharing in violation of the Cencelli manual (Venditti, 2016).

2.1.2 Factions in the Japanese Liberal Democratic Party

While the manual employed by the Italian DC is a unique case of portfolio distribution that relies on *explicit* mathematical calculations, other parties rely on similar measures to quantify the value of cabinet posts and assign them to internal factions. One prominent example is the Japanese Liberal Democratic Party (LDP): before the electoral reform of 1993, government formation and portfolio allocation were internally decided among factions (Sartori, 2005, Kohno, 1992, Ramseyer and Rosenbluth, 2009).

The early LDP factions were personalistic organizations aimed at electing party leaders, and factional size fluctuated considerably with the leaders' retirement or death. In time, turnover decreased until defections from factions almost ceased: after 1972, politicians' fates were tied to the chosen faction until retirement, and changing faction was rare. Moreover, from the 1980s onwards factions were not personalistic anymore; rather, the leader became increasingly seen as an agent for the faction (Bettcher, 2005). Being cohesive and stable, factions acted as unitary actors and the party leadership as a selectorate maximizing factions' collective good.

The allocation of cabinet positions in the LDP consisted of dividing the electoral spoils proportionally among factions and giving a premium to the largest factions (Browne and Kim, 2003, Ramseyer and Rosenbluth, 2009). Since the late 1960s, the number of ministerial positions obtained by each faction has corresponded closely to their relative strength within the party (measured by factions' membership in the Diet), and by the mid-1980s

this method of portfolio allocation was strictly applied. Despite having the opportunity to revise the proposal of cabinet posts (by asking for a leadership change, leaving the party, or calling for a vote of no-confidence), no disagreement ever happened (Adachi and Watanabe, 2007). Moreover, historically no cabinet formation required more than three days, which is a surprisingly short period given that the average length of government formation process in Western Europe is 28 days (Ecker and Meyer, 2015). This evidence suggests how portfolio allocation was a contract stipulated among LDP factions before the realization of the electoral outcome.

Intra-party conflict frequently happened within the LDP, especially before the electoral system's reform in 1994, which decreased the district magnitude to a single-member district. Before 1994 too many candidates from different factions were selected to run in each district, and competition was so destructive that the term *tomodaore* (going down together) was coined to refer to the problem of overnomination, which often led to failure to elect as many representatives as a unified party could have elected (Cox and Rosenbluth, 1996, Nemoto, Pekkanen and Krauss, 2014).

2.2 The Model

Consider a probabilistic model of electoral competition between two parties, *left* and *right*. There are three players in the left party: two factions denoted by L_1, L_2 and a party leader L (*she*). Players in the right party are denoted by R_1, R_2 and R respectively. Denote *left*'s preferred platform by $x^L \in \mathbb{R}$, which is implemented when the party wins the election (the same holds for *right*). Both platforms (x^L, x^R) are common knowledge and fixed.[14] There exists a representative voter, denoted by V, who votes for *left* or *right*. The voter's ideal point is denoted by x^V. Without loss of generality, let $x^V = 0$, and $x^L < x^V < x^R$. For exposition purposes in what follows I will refer to party *left* (the

[14] The latter assumption is relaxed in Subsection 2.4.1, which analyses endogenous platforms.

description of actors in *right* is analogous).

A faction is a unitary team of politicians who share the same ideological preferences: let x_i^L denote the policy preferred by faction L_i, where $i = 1, 2$. I start by assuming that factions in the same party share the same ideological preferences ($x_1^L = x_2^L = x^L$), and relax this assumption in Section 2.4. Each faction can use its resources to increase the party electoral chances by exerting campaigning effort, denoted by e_i^L, and/or to sabotage the other faction, a_i^L. Both actions are costly: $C(e_i^L) = (e_i^L)^2/2$ and $C(a_i^L) = (a_i^L)^2/2$. The assumption of convex costs reflects the decreasing returns associated to each activity: while initially it is easy to find compromising material to sabotage the other faction and good slogans to convince voters, at the margin more resources are needed to have a substantial impact on the campaign.

The goal of the model is to understand which circumstances encourage campaigning effort and which encourage sabotage: in order to do so in a tractable way, the total amount of sabotage is assumed to be equal to $a_i^L = 1 - e_i^L$ — that is, all the resources that are not used to promote the party are invested in damaging the rival faction (this assumption is relaxed in the Appendix). The binding budget constraint together with convex costs implies that a positive level of sabotage is cost efficient: the focus will be on how the equilibrium investment in effort and sabotage changes with parameters of interest.

The party leader — who stands for the party organization — only cares about winning the election.[15] The leader incentivizes factions to invest in campaigning for the party by promising rewards contingent on the electoral outcome. Rewards depend on the total amount of electoral spoils, normalized to one: the winning party gets a share of spoils α, where $\alpha \in [1/2, 1]$, and the losing party gets $(1 - \alpha)$. The parameter α refers to the degree of inter-party power-sharing (Lijphart, 1984, Herrera, Morelli and Palfrey, 2014). I use the

[15] The party leader can be thought of representing the central party organization. As such, the leader does not have ideological preferences and is *above factions*. Subsection 2.4.1 discusses how the leader would tailor the party policy platform to factions' preferences if she belonged to a particular faction.

short-hand "majoritarian democracies" to refer to systems with high α, and "consensus democracies" to refer to systems with low α.

The party leader does not directly observe factions' campaigning effort: L observes a relative ranking indicator that can take two values, $s^L \in \{1,2\}$. When $s^L = 1$ faction L_1 is ranked higher than L_2, and vice-versa when $s^L = 2$. Both campaigning effort and sabotage help factions to rank higher. Formally, the probability that faction L_1 obtains a higher rank than L_2 is:

$$\rho_1^L = \Pr\{s^L = 1\} = \frac{1}{2} + \frac{(e_1^L - e_2^L) + \gamma(a_1^L - a_2^L)}{\phi}. \tag{2.1}$$

The parameter $\gamma \in \mathbb{R}_+$, which is common knowledge, reflects the relative effectiveness of sabotage to rank higher: when $\gamma > 1$ sabotage is more effective than effort in achieving a high internal ranking, while for $\gamma < 1$ investing in campaigning effort is more effective than sabotage.[16] The parameter ϕ is a normalization ensuring that the probability is bounded. The probability that faction L_2 obtains a higher rank is simply $\rho_2^L = 1 - \rho_1^L$.

Based on the indicator s^L, the leader distributes among factions the share of electoral spoils obtained contingent on the party winning (α) or losing the election ($1-\alpha$) by assigning a *premium to the faction that ranks higher* within the party (e.g., faction L_1 if $s^L = 1$). Formally, L assigns π_v^L to L_1 if the left party wins, and π_d^L if it loses (the subscript v stands for victory, while d for defeat). Premia are assumed to be non–negative — that is, the leader can "punish" factions at most with zero incentives. Importantly, this assumption is motivated by real-world instances where party leaders are *de facto* constrained by the existing

[16] The parameter γ refers to institutional and non-institutional factors that make factions' campaigning effort more difficult to monitor and reward by the party. Section 2.5 presents some examples.

measures of factional performance and have no other choice but to abide by them.[17][18] Rewards for factions in *left* satisfy the following budget constraint:

$$\begin{aligned} \pi_v^L + 2b_v^L &= \alpha \\ \pi_d^L + 2b_d^L &= 1 - \alpha, \end{aligned} \tag{2.2}$$

where b_v^L and b_d^L are baseline prizes offered to both factions in case of party victory and defeat respectively. Given the leader's budget constraint assumption (2.2), the value of the baseline prizes is equal to $b_d^L = (1 - \alpha - \pi_d^L)/2$, $b_v^L = (\alpha - \pi_v^L)/2$ and the only relevant choice for L is the vector of premia (π_d^L, π_v^L).[19] The leader chooses (π_d^L, π_v^L) to maximize the probability of winning the election, which is increasing in factions' campaigning effort and determined in equilibrium by the voter's choice.

The voter's payoff has two components: the first is a standard quadratic loss from the distance from parties' platform, the second depends on party's valence, which refers to all those attributes that are valued independently of ideology. Factions' campaigning activities such as constituency service increase the party's appeal to voters by increasing its valence. Formally, V's realized payoff if *left* wins is:

$$u^V(e_1^L, e_2^L; x^L) = -\left(x^V - x^L\right)^2 + e_1^L + e_2^L. \tag{2.3}$$

[17] In the Italian DC case for instance, the leadership knew that a faction's relative higher ranking — corresponding to more membership cards brought to the party — was a symptom of its higher investment in sabotaging activities, but still could not punish factions for bringing more members to the party.

[18] The Appendix relaxes this assumption showing that results are robust to a setup where leaders can punish the higher-ranked faction with a negative premium (i.e., rewarding the lower-ranked faction).

[19] Given the budget constraint assumption, L's incentive scheme can also be interpreted as the share of spoils offered to each faction under the event of party victory and defeat. I distinguish between baseline prizes and premia to reflect real instances of incentives used by parties. For instance, Browne and Kim (2003) note that in the Japanese LDP *"the more numerous positions, notably in the cabinet, were allocated in close proportion to a faction's membership in the Diet, whereas scarcer positions [...] were balanced among the very largest factions"*.

Finally, before the election an exogenous shock that favors party R affects the voter's payoff, where ξ is uniformly distributed in $\left[-\frac{1}{2\psi}, \frac{1}{2\psi}\right]$. I assume that ψ is small enough to ensure a bounded probability of victory for both parties. The parameter ψ can be interpreted as the importance of the electoral campaign: as ψ increases, the support of the shock shrinks and factional campaigning activities (as well as party policy platforms) become more salient to the voter.

Let $\boldsymbol{\pi}^L = (\pi_d^L, \pi_v^L)$ and $\boldsymbol{e}^L = (e_1^L, e_2^L)$. The payoff of faction L_i can be expressed as:

$$u_i^L(\boldsymbol{e}^L, \boldsymbol{\pi}^L; x_i^L) = R_i^L(\boldsymbol{\pi}^L, \boldsymbol{e}^L) - \left(x_i^L - x^*\right)^2 - C(e_i^L) - C(1 - e_i^L), \tag{2.4}$$

where $x^* \in \{x^L, x^R\}$ is the winning party's platform, and the reward $R_i^L(\boldsymbol{\pi}^L, \boldsymbol{e}^L)$ is a function of the incentive scheme $\boldsymbol{\pi}^L$ (which depends on factions' effort $\boldsymbol{e}^L$).[20] The expected rewards from electoral victory and defeat are, respectively:

$$\begin{aligned} R_i^L(\boldsymbol{\pi}^L, \boldsymbol{e}^L)|_v &= b_v^L + \rho_i^L(\boldsymbol{e^L})\pi_v^L, \\ R_i^L(\boldsymbol{\pi}^L, \boldsymbol{e}^L)|_d &= b_d^L + \rho_i^L(\boldsymbol{e^L})\pi_d^L. \end{aligned} \tag{2.5}$$

That is, L_i is rewarded with π_v^L (π_d^L) only when it ranks higher than the other faction (which happens with probability ρ_i^L), and the size of the reward is determined by the electoral institutions ($b_v^L + \pi_v^L > b_d^L + \pi_d^L$, as $\alpha > 1/2$).

The timing of the game is as follows: first, leaders announce an incentive scheme contingent on the electoral outcome. Second, factions decide how much resources to invest in campaigning and sabotage. Finally, elections are held, and prizes are distributed according to the contract. A strategy for L maps from the internal ranking s^L to an incentive scheme (π_d^L, π_v^L). For L_1 and L_2, a strategy is a mapping from the set of incentives to an

[20] Notice that the reward function $R_i^L(\boldsymbol{\pi}^L, e^L)$ also depends on $\boldsymbol{\pi^R}$ and $\boldsymbol{e^R}$, which affect the incentive scheme $\boldsymbol{\pi}^L$ (this is omitted from the notation above for parsimony.

allocation decision e_1^L, e_2^L (and analogously for R_1 and R_2). The voter votes for the party that gives her the higher payoff. The solution concept is Subgame Perfect Equilibrium.

2.3 Equilibrium Analysis

In what follows I start by computing the voter's decision, which determines the probability of each party winning the election. Given this winning probability, the expected payoff of each faction is derived as a function of the other factions' decision, and for each possible incentive scheme offered by the leader. Finally, I compute the incentive scheme chosen by the party leader, and characterize the equilibrium of the game.

The voter prefers party *left* if:

$$u^V(e_1^L, e_2^L; x^L) \geq u^V(e_1^R, e_2^R; x^R) + \xi.$$

The probability that *left* wins the election is the probability that V prefers *left*. By the uniform assumption, this is simply a function of factions' effort ($\boldsymbol{e}$):

$$p^L(\boldsymbol{e}) = \frac{1}{2} + \psi \left[u^V\left(e_1^L, e_2^L; x^L\right) - u^V\left(e_1^R, e_2^R; x^R\right) \right]. \tag{2.6}$$

Factions choose how many resources to allocate in campaigning and sabotage. Formally, L_1 solves:

$$\max_{e_1^L \in [0,1]} p^L(\boldsymbol{e}) \left[b_v^L + \rho_1^L \pi_v^L \right] + \left(1 - p^L(\boldsymbol{e})\right) \left[b_d^L + \rho_1^L \pi_d^L - (x^L - x^R)^2 \right] - \frac{\left(e_1^L\right)^2}{2} - \frac{\left(1 - e_1^L\right)^2}{2},$$

where the first term (expected payoff from winning the election) does not include an ideological cost because $x_1^L = x^L$. Notice that e_1^L has two effects on factions' expected payoff: first, campaigning increases the party's electoral chances via higher $p^L(\boldsymbol{e})$. Second, e_1^L enters the probability of ranking higher within the party (ρ_1^L): this component reflects

the strategic tension faced by factions.

Depending on the value of γ, the probability of ranking higher could be increasing or decreasing in campaigning: this follows from (2.1) and the assumption $a_i^L = 1 - e_i^L$. When $\gamma < 1$, campaigning effort helps winning the election and improves the odds of being assigned a positive premium by the leader. The trade-off between campaigning effort and sabotage arises when $\gamma > 1$: while sabotage increases the odds of a high internal ranking (hence a higher share of spoils), campaigning helps the party to win the election. This trade-off is apparent in the faction's first-order condition, which can be written as:

$$\underbrace{\frac{\partial p^L(\boldsymbol{e})}{\partial e_1^L}\Big[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\Big]}_{\text{External Incentive}} + \underbrace{\frac{\partial \rho_1^L}{\partial e_1^L}\Big[p^L\pi_v^L + (1-p^L)\pi_d^L\Big]}_{\text{Internal Incentive}} + 1 - 2e_1^L = 0, \quad (2.7)$$

where the first term represents the marginal return of effort on winning the election while keeping the competition inside the party fixed, and the second term corresponds to the marginal return of effort on ranking higher within the party holding the electoral incentives fixed. The first term is always positive — i.e., factions' campaigning always improves the party's electoral chances in the election. The sign of the internal incentive term depends on whether sabotage is more effective than campaigning: when $\gamma < 1$ the internal incentive term is positive (campaigning helps towards achieving a high ranking), whereas it is negative when $\gamma > 1$ (sabotage is more effective than campaigning for ranking higher).

The Appendix shows that each faction's objective is concave, which implies that the first-order condition above identifies the solution to the faction's maximization problem. The solution of the system of first-order conditions, one for each faction in each party, determines factional effort as a best reply to the other factions' efforts, for both incentives schemes (π_d^L, π_v^L) and (π_d^R, π_v^R). For ease of notation, the following analysis refers to

equilibrium effort as e_1^{L*} (and analogously for the other factions).

The leader chooses premia to maximize the probability of winning the election, which is increasing in campaigning effort. Substituting the value of the voter's realized payoffs into the probability of victory expression (2.6) we can formally express L's problem as:

$$\max_{\pi_d^L, \pi_v^L} \quad \frac{1}{2} + \psi \left[e_1^{L*} + e_2^{L*} - e_1^{R*} - e_2^{R*} - (x^L)^2 + (x^R)^2 \right]. \tag{2.8}$$

How can the leader give each faction stake in the party's electoral success? Let campaigning effort be more effective than sabotage ($\gamma < 1$). The first result below shows that in this case the leader gives the highest feasible premium (all the electoral spoils) to the faction ranking higher, and the second faction is not rewarded (i.e., incentives are high powered). By doing so, the leader increases factions' incentives to campaign. Conversely, when sabotage is more effective than campaigning effort ($\gamma > 1$) a positive premium to the faction ranking higher incentivizes sabotage. In this case, the leader's optimal strategy is to set zero premia: that is, both factions receive an equal share of spoils for all the election outcomes (hence incentives are low powered).

The first result derives the equilibrium when no party has an ex-ante electoral advantage over the other due to policy platforms. Since $x^L < 0 < x^R$, the assumption of no electoral advantage means that either both parties' platforms coincide with x^V (i.e., $x^L = x^R = 0$), or that platforms are equidistant from it ($x^L = -x^R$). The assumption will be relaxed in the next section, which analyses the equilibrium for any policy platforms such that $x^L < 0 < x^R$. While less general, this first result is valuable because it yields a simple closed-form solution for the equilibrium effort and intuitive comparative statics.

Proposition 2.1. Equilibrium without ex-ante Electoral Advantage. *Suppose* $x^L = -x^R$. *Then, the optimal incentives offered by L in equilibrium (and, symmetrically, by R) are* $(\pi_d^{L*}, \pi_v^{L*}) = (0,0)$ *if* $\gamma > 1$, *and* $(\pi_d^{L*}, \pi_v^{L*}) = (1-\alpha, \alpha)$ *if* $\gamma < 1$. *The unique level of campaigning effort for both*

factions is:

$$e^{L*} = \begin{cases} \dfrac{2 + \psi\left(2\alpha - 1 + 2\left(x^L - x^R\right)^2\right)}{4} & \text{if} \quad \gamma > 1 \\ \dfrac{5 - \gamma + 2\psi\left(2\alpha - 1 + 2\left(x^L - x^R\right)^2\right)}{8} & \text{if} \quad \gamma < 1 \end{cases} \tag{2.9}$$

Proof. Unless otherwise stated, all proofs are collected in the Appendix. □

When sabotage is more effective than campaigning effort in achieving primacy within the party ($\gamma > 1$) the leader's optimal strategy is not to reward it, hence incentives are low powered — i.e., the equilibrium incentive scheme has zero premia. Conversely, when $\gamma < 1$ the equilibrium incentive scheme features high powered incentives. Intuitively, in this case the incentives to exert campaigning effort arise from both the election and the internal ranking indicator, while sabotage only hurts factional welfare. Hence, the party leader designs the internal contest such that the faction with the higher internal ranking is rewarded with the highest feasible premium (all the electoral spoils) — contingent on the electoral outcome — and the second faction is not rewarded. By doing so, the leader increases factions' incentives to campaign for the party. This result is in line with standard intuition from contest theory suggesting that the effort-maximizing incentive scheme is a winner-take-all contest — i.e., high powered incentives are optimal in contests where the probability of winning is increasing in effort (Nalebuff and Stiglitz, 1983).

The expression for the equilibrium campaigning effort e^{L*} in Proposition 2.1 allows us to directly check how factions' campaigning effort changes in equilibrium with (i) the amount of power sharing of the institutional setting $(1 - \alpha)$, (ii) the importance of the electoral campaign (ψ), and (iii) parties' ideological extremism (x^L, x^R).

Corollary 2.1. Electoral Environment. *For all γ:*

(i) factions' campaigning effort (e^{L*}) increases with the importance of the electoral campaign (ψ),

(ii) e^{L*} decreases with the proportionality — or amount of power granted to minorities — of the institutional setting $(1 - \alpha)$.

The proof follows by inspection of the closed-form solution for equilibrium effort in Proposition 2.1. Intuitively, when the support of the aggregate shock gets smaller (higher ψ), the electoral outcome depends less on the random component and more on factional campaigning effort. As a consequence, factional effort is more effective in influencing the voter's decision. Perhaps less intuitively, factional campaigning effort in equilibrium is strictly increasing in α (or alternatively, factional sabotage is strictly decreasing in α): as the power granted to minority parties increases (as α goes down), in equilibrium factions invest more resources in sabotaging each other and less in campaigning for the party. In the limit ($\alpha \to 1/2$), winning the election provides the same electoral spoils as losing, which leads factions to focus on the competition *within* the party.

The effect of α on campaigning suggests a simple yet neglected relation between inter-party and intra-party competition. Constitutional design scholars typically focus on the incentives that institutions produce at the party level (Lijphart, 1984, Powell Jr, 2000): majoritarian democracies are associated with adversarial fights for power, consensual democracies with bargaining and compromise across parties. Proposition 2.1 suggests that an institutional change in the electoral stakes can also affect competition within parties. Notice that a change in α might refer to a change in the electoral system (e.g., from winner-take-all to proportional), or to an institutional change holding fixed the electoral system's proportionality (e.g., from executive dominance to legislative-executive balance). As such, the result applies to two-party as well as multi-party systems.

A similar mechanism could also arise through an increase in polarization, for which I resort to the following working definition: polarization increases if x^L decreases and x^R increases by the same amount, thus holding $x^L + x^R$ constant.[21] This ensures that any

[21] Notice that this condition is trivially satisfied when no party has an ex-ante electoral advantage.

increase in polarization does not change the identity of the (ex-ante) advantaged party, and allows us to focus exclusively on the level of divergence between party platforms ($x^L - x^R$). By increasing the stakes of the election, party polarization can motivate factions to campaign for the party.

Corollary 2.2. Polarization. *For all γ, factions' campaigning effort (e^{L*}) increases with ideological polarization: as the distance between x^L and x^R increases, factions invest more resources in campaigning effort and less in sabotaging activities.*

To see how polarization can affect factional behavior consider factions' payoff from losing the election in the following two cases. First, when $x^L = x^R = 0$, the ex-ante probability of victory for each party is the same and factions do not suffer any ideological cost from losing the election. When $x^L = -x^R$ and $x^L, x^R \neq 0$, parties' ex-ante winning probability does not change but now factions suffer a cost from losing the election — which is increasing in $x^L - x^R$. This increasing cost in turn implies that, as ideological polarization increases, factions invest more resources in campaigning effort (refraining from sabotaging each other), in order to avoid a costly unfavorable electoral outcome.

2.3.1 Introducing Electoral Imbalance

One question that arises when parties are heterogeneous in their ex-ante winning probability is which factions campaign more for the party between those in the leading and trailing party. To answer this question, I relax the assumption that party platforms are equidistant from the voter's preferred platform, thus allowing for ex-ante electoral imbalance in parties' electoral prospects.

The next result establishes the consequences of party ideological extremism on factional campaigning effort and parties' electoral prospect, for any platform x^L, x^R such that $x^L < 0 < x^R$. The first part of Proposition 2.2 generalizes the effect of polarization to

the case of general platforms, showing that the comparative statics highlighted by Corollary 2.2 continue to hold.

The second part of the result focuses on the difference between total campaigning effort in *left* and *right* ($2e^{L*} - 2e^{R*}$). When platforms are not equidistant from the median, an increase in platforms' extremism affects campaigning effort in equilibrium through an additional channel: the change in the odds of winning the election. The result shows that, when $\gamma < 1$, an increase in a party's extremism — defined as the distance between the party platform and the voter's preferred platform — leads its factions to campaign less than the other party's factions. The next result assumes without loss of generality that the ex-ante winning probability of *left* is lower than *right*: $|x^L| > |x^R|$.[22]

Proposition 2.2. Ideological Extremism.

(i) For all γ, factional campaigning effort in both parties (e^{L*}, e^{R*}) increases with polarization.

(ii) When $\gamma < 1$, $\partial(2e^{L*} - 2e^{R*})/\partial|x^L| < 0$ for all x^R, and $\partial\left(2e^{R*} - 2e^{L*}\right)/\partial|x^R| < 0$ for all x^L. When $\gamma > 1$, factions in both parties campaign equally.

The intuition for the first part of Proposition 2.2 is analogous to that of Corollary 2.2: when polarization ($x^L - x^R$) increases, factions' expected payoff from losing decreases because of the ideological loss they suffer. This in turn increases the marginal return from exerting campaigning effort, to avoid the unfavorable event of an electoral defeat.

Proposition 2.2(ii) shows that, when $\gamma < 1$, factions in the moderate party campaign more than those in the extreme party. Because $\gamma < 1$, in equilibrium incentives are high powered ($\pi_d^{L*} = \pi_d^{R*} = 1 - \alpha$, $\pi_v^{L*} = \pi_v^{R*} = \alpha$). Since $\alpha > 1/2$, the expected payoff from the election is lower for L_1, L_2: i.e., the *internal incentive* term in the faction's first-order condition is lower for L_1, L_2 as in equilibrium $p^L(\boldsymbol{e}^*) < 1/2$. As x^L moves away from x^V, the

[22] In the Appendix I derive the vector of equilibrium effort choices as the unique solution (in closed form) of the system of factions' first-order conditions. The closed form solution is omitted from the main text as it does not provide further intuition than (2.9). The Appendix also shows that the equilibrium incentive scheme is the same as the one derived in Proposition 2.1, when factions are equidistant from x^V.

left party's expected payoff from the election decreases (via a lower winning probability), which induces its factions to campaign less for the party. Conversely, factions in the more moderate party campaign more in equilibrium, and the difference in parties' total effort is increasing in the extremism of the trailing party's platform. Hence, trailing parties are more likely to be hornets' nests, with factions investing in sabotage rather than working for the party.

Proposition 2.2(ii) also suggests that factional incentives to sabotage increase as the party weakens. This prediction offers an unexplored explanation of observed empirical patterns of intra-party competition. Golden and Chang (2001) identify political fights within the Italian DC party as one of the main causes of the corruption scandals involving the party deputies. Plausibly, the increased political competition resulting from the steady rise of the left and the associated loss of spoils faced by DC factions contributed to increasing factional sabotage: as the stakes of the election decreased, the appeal of securing internal power became more important to factions.[23] This explanation is consistent with the high levels of intra-party competition, and resulting corruption scandals, that doomed the DC party and contributed to end the Italian "First Republic".

Finally, when $\gamma > 1$ all the premia are set to zero in equilibrium, and $e^{L*} = e^{R*}$ regardless of the distance between policy platforms. With zero premia, the *internal incentive* term in the faction's first-order condition is equal to zero, and the incentive to campaing exclusively arises from the *external incentive*. The latter depends only on the difference between the two party platforms and is the same for factions in *left* and *right*. Thus, when $\gamma > 1$ and $|x^L| > |x^R|$ both parties' factions exert the same amount of campaigning in equilibrium — even though *left*'s ex-ante winning probability is lower than the one of *right* — and the expression $\partial\left(e^{L*} - e^{R*}\right)/\partial|x^L|$ in equilibrium is equal to zero.[24]

[23] In particular, the rise of the left was triggered by the Socialist Party becoming more moderate in the 1970s and 1980s.

[24] One extension in the Appendix shows that, when allowing for negative premia, the result $\partial(e^{L*} -$

Finally, notice that belonging to an underdog party is always costly for factions. Let $\mathcal{W}^L$ be the welfare of factions in the left party, where

$$\mathcal{W}^L(x^L) = p^L\alpha + (1-p^L)\big[1-\alpha-2(x^L-x^R)^2\big] - \frac{e_1^2+e_2^2}{2} - \frac{(1-e_1)^2+(1-e_2)^2}{2}. \quad (2.10)$$

Remark 2.1. *Factions welfare is strictly decreasing in* $|x^L|$.

Ideological extremism hurts factional welfare via two channels: it decreases the probability of succeeding in the election and it increases the stakes of losing via a higher ideological cost.

So far I assumed that factions in the same party — having the same ideological preferences — suffer the same ideological cost for losing the election, and Proposition 2.2 shows how campaigning effort in equilibrium changes across parties with ideological distance. The next section relaxes this assumption and shows how campaigning effort changes as a function of each faction's ideological extremism.

2.4 Factions' Ideological Heterogeneity

This section relaxes the assumption of factions' homogeneous preferences within the party. Without loss of generality, let faction L_1 be more extreme than L_2 ($x_1^L < x_2^L < 0$). I assume that the policy platform implemented by a party corresponds to the simple average of its factions' ideological bliss points, i.e., $x^L = (x_1^L + x_2^L)/2$ (and symmetrically for x^R). Later in this section I relax this assumption and consider policy platforms as weighted averages of factions' bliss points, where the weights depend on factions' relative power.[25] This assumption is based on the empirical observation that, comparing factions'

$e^{R*}\big)/\partial|x^L| < 0$ generalizes for all values of γ. By allowing the party to punish the faction ranking higher (rewarding the faction ranking lower) when $\gamma > 1$, negative premia create the same incentive to campaign as high powered incentives in the case $\gamma < 1$.

[25] In this extension weights are decided by the party leader, who can reward the higher ranking faction with "policy concessions" (granting more influence in the party platform).

ideal points with the overall party position, factions bound the party in its platform choice (Ceron, 2012).

The next result illustrates the equilibrium when factions of the same party differ in ideology, showing how polarization *within* parties affects factional incentives to campaign for the party.

Proposition 2.3. Heterogeneous Factions. *In equilibrium, ideologically extreme factions campaign more than moderate ones, which instead devote more resources to sabotage. The equilibrium incentive scheme is analogous to the homogeneous case:* $(\pi_d^{L*}, \pi_v^{L*}) = (0, 0)$ *if* $\gamma > 1$, *and* $(\pi_d^{L*}, \pi_v^{L*}) = (1 - \alpha, \alpha)$ *if* $\gamma < 1$.

Proposition 2.3 demonstrates that when factions in the same party do not share the same ideological position, the extreme faction invests more in the electoral campaign than the moderate one, which sabotages more instead. Intuitively, the moderate faction L_2 is ideologically closer to *right*'s bliss point than the extreme one L_1, thus suffering a lower cost for losing the election. As a consequence, L_2 invests more resources into sabotaging the rival faction.

This result underscores the different effect that ideological polarization produces *within* and *across* parties. Proposition 2.2 has shown that, when parties are polarized, factions in the more extreme party sabotage more than factions in the leading, moderate party. In contrast, Proposition 2.3 shows that, when *factions* within the same party are polarized, the more extreme faction invests more in campaigning than the moderate faction. Intuitively, as a faction becomes more extreme the expected payoff of both factions decreases (via a lower winning probability), leading to a reduction in campaigning by both factions. Yet, campaigning decreases asymmetrically: the extreme faction campaigns more because the stakes of the election are greater, suffering a higher ideological loss from losing.

This logic is consistent with the different behavior of the extreme and moderate factions of the Labour Party during the 2017 UK electoral campaign. There is evidence that

the Labour Left "largely relied on positive campaigning and mobilized grassroots activism to an extent rarely seen before, ensuring that it inspired new voters" (Bell, 2018). For example, the grassroots movement "Momentum" helped the Labour Party win 32 new seats in the 2017 election, even supporting moderate candidates.[26] Conversely, moderate Labour MPs extensively engaged in sabotage against Corbyn's campaign, as recently described in an internal report of the Labour Party.[27]

The reader might wonder why the leader would commit to using the ranking indicator at all in this case, given that she would be strictly better off rewarding the faction which exerted more effort (the more extreme faction, in equilibrium). That is, L would want to design a non-anonymous contract that punishes sabotage more for the moderate faction. However, non-anonymous incentive schemes are typically not feasible: this assumption is not realistic in all those cases where leaders are constrained by party legal rules and formal procedures, which are the same for all factions and are decided ex-ante. Yet, if the leader could decide over the party policy platform, she would be able to reward the moderate faction through a policy concession, that is, setting the party platform closer to the moderate faction's preferred position. The next section analyses this possibility, showing that leaders could tailor policies to factional preferences to increase the party's electoral chances.

2.4.1 Policy Concessions as Incentives to Factions

How can parties tailor policies to factional preferences in order to increase electoral chances? Typically, party manifestos weigh factions' preferred platforms based on their share of votes gained during congresses (Levy, 2004, Ceron, 2012, Lo, Proksch and Slapin,

[26] See Lott, R. (2019) 'Inside Momentum, Labour's Secret Weapon', Vice, 18 November.

[27] The report describes a "hyper-factional atmosphere" where more right-wing senior Labour staff actively seek to sabotage the work of those on the party's left, referring to them contemptuously as "Trots" (2020 Labour Antisemitism Report, Section 2.1.3.i).

2016, Dewan and Squintani, 2016). The following extension adds this feature to the model.

While the baseline model assumes that both factions have the same weight in determining the party platform, this section endogenizes the weight of each faction, asking which policy weight the party adopts in equilibrium. Let the party leader L choose — in addition to premia — how much to weigh the preferred policy of the faction ranking higher, where the policy weight is denoted by $\lambda \in [1/2, 1]$. Formally, a strategy for L is now defined by an incentive scheme (π_d^L, π_v^L) and a policy weight (λ).

The timing of the game remains unchanged: first, L announces an incentive scheme $(\pi_d^L, \pi_v^L, \lambda)$. Second, factions decide how much resources to invest in campaigning and sabotage. Finally, elections are held, and premia (π_d^L, π_v^L) as well as policy concessions (determined by λ) are distributed. The voter compares the same party platforms — i.e., simple averages of the factional bliss points — as in the baseline model. That is, the voter does not anticipate the post-electoral bargaining process that takes place within parties when comparing parties' platforms. Notice that policy concessions are meted out once the internal ranking is revealed, which happens *after* the electoral outcome is known. These assumptions imply that λ affects factions' decision only through their expected reward.[28]

To see how λ affects factions' decision, it is convenient to express faction L_1's expected reward *from electoral victory* as

$$R_1^L(\boldsymbol{\pi}^L, \boldsymbol{e}^L, \lambda)|_v = b_v^L + \rho_1^L \pi_v^L - \left(x_1^L - x^L(\lambda, \boldsymbol{e^L})\right)^2, \tag{2.11}$$

[28] The fact that policy concessions can only be post-electoral together with the voter's naïvete assumption imply that λ affects the probability of electoral victory only indirectly, through factions' campaigning effort.

where

$$x^L(\lambda, \boldsymbol{e^L}) = \begin{cases} \lambda x_1^L + (1-\lambda)x_2^L & \text{if} \quad s^L(\boldsymbol{e^L}) = 1 \\ (1-\lambda)x_1^L + \lambda x_2^L & \text{if} \quad s^L(\boldsymbol{e^L}) = 2. \end{cases} \tag{2.12}$$

That is, the policy incentive consists in a lower policy cost of ranking higher (and a higher cost of ranking lower), conditional on winning the election. Conversely, L_1's expected reward *from losing the election* does not depend on λ — and is therefore equivalent to the baseline model (2.5) — because the implemented policy platform in the event of electoral defeat is chosen by *right*.

Recall from Proposition 2.3 that the ideologically extreme faction campaigns more than the moderate one in equilibrium, as the latter suffers a lower ideological cost from losing the election. This difference is crucial for the next result, which shows that under certain conditions the leader might reward sabotage with policy concessions.

Proposition 2.4. Policy Concessions. *Let* $|x_1^L - x_2^L| > 0$. *When* $\gamma > 1$, *in equilibrium the leader rewards sabotage contingent on electoral victory by setting* $\lambda^* = 1$, *and premia are* $(\pi_d^{L*}, \pi_v^{L*}) = (0, 0)$. *When* $\gamma < 1$, *the equilibrium premia are* $(\pi_d^{L*}, \pi_v^{L*}) = (1-\alpha, \alpha)$, *and there exists* d' *such that if* $|x_1^L - x_2^L| < d'$, *then* $\lambda^* = 1$; *if* $|x_1^L - x_2^L| \geq d'$, *then* $\lambda^* = 1/2$.

Proposition 2.4 states that, when $\gamma > 1$, L rewards the strongest faction by setting the party platform equal to the faction's preferred policy. When sabotage is more effective than campaigning to achieve a higher internal ranking, the faction that ranks higher is the one that (probabilistically) sabotages more (Proposition 2.3). In this case, setting a positive premium corresponds to rewarding sabotage, and the equilibrium premia (π_d^{L*}, π_v^{L*}) are set to zero as in the baseline model. In equilibrium, the leader promises a policy concession *contingent on victory* to the faction for which the ranking is higher, by setting $\lambda^* = 1$. This motivates the moderate faction L_2 — which in equilibrium is more likely to obtain the policy concession — to campaign more for the party and less against the other

faction.

To understand why this is the case, it is key to note that, when the relative ranking indicator rewards sabotage, the more extreme faction campaigns more in equilibrium ($e_1^{L*} > e_2^{L*}$). This in turn implies that $\rho_2^L > \rho_1^L$. That is, the internal contest among factions is not a coin flip anymore: the moderate faction L_2 has more chances to win the premium than L_1. In this case, a policy concession incentivizes L_2's equilibrium effort, to increase the party's chances of victory. Crucially, the extreme faction's effort is always greater than the moderate one in equilibrium. This implies that, even if e_2^{L*} increases under λ^*, $\rho_2^L > \rho_1^L$ and L_2 still ranks higher in equilibrium.

When $\gamma < 1$, the extreme faction (which campaigns more in equilibrium) is more likely to rank higher than the moderate one, as campaigning is more effective than sabotage. In this case, a high λ incentivizes factions to campaign in order to rank higher thus moving the party platform closer to their bliss point. This clearly helps the party win the election via higher campaigning. Indeed, when the ideological distance between L_1 and L_2 is low enough, the leader sets $\lambda^* = 1$ to maximize total effort.

Suppose now that $|x_1^L - x_2^L|$ is high enough: in this scenario, a high λ reduces the appeal of electoral victory to the moderate L_2 by shifting the party platform to the extreme x_1^L. When the distance between factions' bliss point is high enough, the loss from the moderate faction's sabotage outweighs the gain in campaigning of the extreme faction, and the leader sets low powered incentives, choosing not to reward any faction with a policy concession.

Finally, Proposition 2.4 suggests how the equilibrium incentive scheme would vary if the leader had ideological preferences. Suppose that L shares the same ideological preferences of the extreme faction L_1, and suppose that $\gamma > 1$. In this case, the leader would trade-off a lower ideological cost by decreasing λ — because in equilibrium the moderate L_2 is more likely to rank higher — and a higher probability of victory by increasing λ,

via higher total effort. Thus, by allowing leaders to share ideological preferences with factions, the forces highlighted in Proposition 2.4 would still be at work, but the leader would have to weigh the incentive to increase the probability of victory of the party with her ideological cost of rewarding with policy concessions a platform distant from her own bliss point.

2.5 Empirical Implications

This section discusses the empirical implications of the model's findings for the study of factions and party organizations. I first analyze the implications of institutional minority rights' protection and polarization on factional behavior. I then turn to the implications for the internal organization parties should adopt. Finally, I discuss potential operationalizations of sabotage.

Institutional System and Sabotage. Corollary 2.1 predicts that intra-party sabotage should increase as the system of government tends to a consensus democracy, granting more power to losing parties. As minority parties obtain a higher share of electoral spoils, factions become more incentivized to sabotage each other (rather than investing their resources to promote the party in the general election) in order to obtain a higher share of the spoils. Hence, we should expect sabotage to be empirically associated with parties' representation in government, with whether seats are reserved for small parties and how easy it is to start a new party, with electoral thresholds for parliamentary representation, with the electoral system (proportional vs. majoritarian), and other institutional constraints such as whether the system is unicameral vs. bicameral, or centralized vs. federalist (Lijphart, 1984).

Polarization and Electoral Security. Proposition 2.2 suggests that an increase in party polarization leads to less sabotage, as factions face a higher ideological cost from losing the election. Moreover, when parties have different ex-ante electoral chances, intra-party sabotage should be more pervasive in trailing parties. While polarization increases campaigning effort for both parties' factions via an increased cost of losing the election, the amount of campaigning in equilibrium varies with parties' electoral security. In particular, campaigning is less valuable to factions in trailing parties, who are less likely to win the election. Hence, we should expect factions in trailing parties to sabotage more.

Variation in Sabotage Relative Effectiveness. The model shows that the party choice of incentives changes with γ, the relative effectiveness of sabotage to achieve a higher ranking within the party. The parameter γ can refer to institutional and non-institutional features of the environment that make factional campaigning effort harder to reward by the party: the electoral system (e.g., list flexibility) is an example of the former, factional geographical dispersion of the latter.

An increase in factional *geographic dispersion* (e.g., a shift from factions' geographical separation to their overlap) could be represented in the model by an increase in γ. If factions are associated with geographic strongholds, the party can attribute its vote share in a given district to the local faction's campaigning activities, and consider it when designing the incentive scheme. Ceteris paribus, a change to factions that overlap geographically corresponds to an increase in sabotage's relative effectiveness, as it becomes harder to associate campaigning effort to each region's vote share.

The parameter γ can also capture features of the electoral system, such as the use of preference votes. There is considerable variation in *list flexibility* among proportional representation systems, with a majority of countries adopting a closed list system. A shift from closed to open list — which can be represented in the model as a decrease in γ —

could make sabotage less effective than campaigning. This happens when candidates mainly obtain preference votes by campaigning effort rather than by sabotaging activities. Intuitively, the party observes its candidates' preference votes, and knows each candidate's faction. The party equilibrium incentive scheme can then move from low-powered to high-powered incentives — rewarding factions for their preference votes — reducing factions' equilibrium investment in sabotage as a result.

The literature on personal vote suggests that moving from a closed list to an open list PR system should increase competition among candidates in a party: looking at the individual candidates' incentives, an open list system implies the need to obtain preference votes, often fighting rivals within the party (Carey and Shugart, 1995, Bräuninger, Brunner and Däubler, 2012). While the incentive to compete within the party increases at the *individual candidate* level, the model shows that the incentive to sabotage could be reduced at the *faction* level. Hence, by considering factions instead of individual candidates as unit of analysis, empirical scholars might uncover potential omitted variable bias in the correlation between weak parties and open list PR systems, controlling for a novel moderating variable — that is, the equilibrium party organization which affects factions' decision to sabotage.

Finally, observed party organizations are consistent with the model's implications. The method of allocation of cabinet positions in the LDP (before the electoral reform in 1994) was to divide the electoral spoils proportionally among factions and give a premium to the "mainstream faction" (Browne and Kim, 2003, Ramseyer and Rosenbluth, 2009). This method corresponds in the model to high powered incentives, which are optimal when effort is more effective than sabotage. Similarly to preference votes, the Japanese SNTV electoral system allowed the party to condition the faction's reward on the the elected party members' identity — the mainstream faction obtaining the premium was, in fact, the faction with the most winning candidates.

Empirical Challenge: Measuring Intra-Party Sabotage. Existing empirical research has focused on negative campaigning against opposing parties, but rarely on measuring intra-party dissent. One implication that can be derived from the model is the emergence of political scandals triggered internally as a product of factional sabotage. Besides resulting from the opposition's attacks (Dziuda and Howell, 2021), political scandals can emerge due to intra-party competition, where party insiders leak information on co-partisans' misdeeds in order to gain power within the party (Balán, 2011). If factional competition can trigger the outbreak of scandals, then Proposition 2.2 suggests that these are more likely to emerge when a party weakens electorally.

A possible way to measure political scandals is to consider charges of malfeasance against parliament members, often resulting in corruption scandals. In most democracies, before proceeding with a judicial investigation of a legislator, public prosecutors need to ask official permission from the legislative body to lift the immunity of the involved deputy. For instance, in Italy, these requests to proceed — *richieste di autorizzazione a procedere (RAP)* — are sent to the Chamber of Deputies, and from 1948 the Italian judiciary made more than 5000 requests to parliament to proceed with MPs' investigation.

Golden and Chang (2001) find that the number of RAPs against DC deputies is positively related to intra-party competition, proxied by the number of preference votes received by DC candidates in a district and divided by the total number of list votes received by the party in the same district. Furthermore, the public availability of the requests allows to delve deeper into the political motives of the investigations. Indeed, several requests include the "leaker" identity, who is often another politician. Analyzing RAPs from 1983 to 2019, Invernizzi and Ceron (2020) identify the leaker's political affiliation, and provide evidence of a political use of denunciations. The paper shows that when a party weakens, the likelihood that political enemies denounce past misbehavior of members of the weakened party increases, suggesting that the political use of denun-

ciation is elastic to changes in the electoral odds. In some cases, they show, these political enemies belong to the same party — but to a different faction — of the accused MPs. These findings provide further evidence in favor of the hypothesis that factional sabotage should increase as parties weaken.

2.6 Conclusion

In their efforts to win office, political parties strategically change their internal organization. One potent tool used by parties is the allocation of electoral spoils among party members, who typically form factions to achieve their policy positions. This paper captures with a formal model the relation of agency among the party leadership and factions. The model formalizes with contract theory tools the allocation of electoral spoils among competing factions. This agency framework is embedded in a general equilibrium model of elections, which allows studying how electoral stakes affect intra-party competition.

The baseline model shows that factions' contests over electoral spoils can be positive or destructive depending on several features of the competitive environment. First, as the power granted to minority parties increases, factions invest more resources into sabotaging each other and less in mobilizing for the party. Conversely, when the stakes of the election increase — via polarization or institutional changes — factions invest more in campaigning for the party. This finding improves our understanding of alternative democratic systems by highlighting the often neglected effect of different electoral institutions on intra-party competition.

The model also shows the effect of ideological polarization on intra-party competition. As polarization increases, factions in both parties campaign more for the party to avoid a costly electoral defeat. While factions in the moderate party campaign more, those in the more extreme party engage in sabotage. Thus, the model suggests that — in the presence of electoral imbalance — intra-party competition should be more severe in trailing

parties and when parties weaken electorally. The latter result is consistent with empirical evidence of political use of denunciation against Italian MPs belonging to weakened parties.

Anticipating factions' incentives, the party can limit sabotage by rewarding factions for their campaigning effort. When factions' campaigning effort can be monitored and rewarded easily, the party encourages competition among factions through a winner-take-all contest for electoral spoils. When, on the other hand, sabotage is more effective than campaigning effort to achieve internal power, the party distributes electoral spoils among factions in an egalitarian way to discourage destructive competition. An extension endogenizes party platforms as part of the leader strategy, showing that the leader might want to reward factions with policy concession to increase the party electoral chances.

The model shows how incentives change when parties have to cope with imperfect signals of effort, in the presence of sabotaging activities. The same approach can be extended to compare the efficiency of different incentive schemes within political parties. In particular, the analysis of a proportional contest function — that is, a proportional allocation of electoral spoils relative to each faction's own performance rather than factions' relative performance — is perhaps one of the most promising research avenues that emerge from this model's findings. This would shed light on the question of which is the optimal party structure to win elections.

Chapter 3: Politics by Denunciation

"Apart from the Punic Wars, for which I was too young, I've been blamed for everything that's happened in Italy but I never filed a lawsuit, for a simple reason, I have a sense of humor. There is another thing I have: a large archive, given I have not much use for fantasy, and everytime I speak about this archive, who must shut up, as if by magic, start to be silent."

– Giulio Andreotti, *Il Divo*

Political scandals — typically defined as "corruption revealed" (Thompson, 2013, Lowi, 2018) — are a fundamental component of politics, shaping political events and voters' opinions. The political consequences of revealing a corrupt political environment reach far: scholars have hypothesized that the deterioration of citizens' political support observed in Western democracies during the past decades is connected with the increased number of political scandals (Bowler and Karp, 2004, Thompson, 2013). The end of the Italian "First Republic" was indeed triggered by *Tangentopoli*, the corruption scandals disclosed during one of the major judicial investigations of all times (Waters, 1994), which took place in 1992-1994 and involved several political parties and politicians. For instance, Giulio Andreotti — one of the most influential politicians of the Italian First Republic,[1] whom the quote is attributed to — was involved in a decade-long judicial trial under charges of corruption and collaboration with the Mafia. The trial generated a major scandal, and Andreotti's acquittal is still questioned by many.[2]

[1] Andreotti has received the highest number of government assignments in the history of the Italian Republic.

[2] Cf. "Giulio Andreotti," *The Times*, May 7 2013: https://www.thetimes.co.uk/article/giulio-andreotti.

Judicial prosecution of politicians constitutes a prominent source of political scandals. While the opinion that political enemies initiate judicial investigations is popular, empirical evidence is intrinsically hard to gather. Data on judicial investigations is often limited to whether an investigation took place or not, and whether it ended in a conviction. As for political enemies, typically what is observable is their reaction to the investigation, for example through public statements condemning the investigated politician. This paper takes advantage of unique data on political corruption to study the political nature of judicial investigations. By leveraging new data on the source of judicial investigations against Italian MPs involved in different crimes (1983-2019), we provide evidence that scandals are the result of *politics by denunciation*.

The measure of judicial investigation against MPs is the "request to proceed" (*Richiesta di Autorizzazione a Procedere,* hereafter RAP) sent by public prosecutor offices to the Chamber of Deputies. In these 36 years, public prosecutors have sent to the Parliament hundreds of requests to lift immunity of the involved MPs, all of which are publicly available. We are interested in the strategic use of these investigations for political purposes. While not all RAPs necessarily result in scandals, on average they hurt politicians' reputation (Chang, Golden and Hill, 2010). Thus, it is reasonable to expect political enemies to strategically initiate RAPs against MPs for their political gain.

The Italian data represent an unparalleled opportunity due to the rich details included in the investigation documents. The uniqueness of our data consists in the revelation of the source (or whistle-blower) — often another political actor — behind the investigation, thanks to which we can provide evidence of a political use of denunciations.[3] Our dataset is composed of 1125 requests involving 451 MPs: 597 RAPs refer to allegations of corruption and 528 to opinion crimes. Examples of the latter include slander, defamation or

[3] Examples of political actors include other MPs, local politicians, head or members of political associations.

incitement to disobey the law.[4] Among these RAPs, 398 specify in the official document that the whistle-blower is another politician or a member of a political organization or association.

The main question we ask is: how politically-driven are denunciations? We expect political denunciations to be tied to the electoral performance of the accused MP's party. On the one hand, it could be that a party loss of electoral support opens the door to attacks from politicians that might benefit from denouncing past misbehavior of members of the weakened party. These attacks could be initiated by members of opposing parties who benefit from replacing the attacked MP with an ally (Dziuda and Howell, 2021), or by members of the same party who seek opportunities to achieve more power within the party through internal sabotage (Invernizzi, 2020*a*). On the other, if a party is electorally strong and hard to overcome with votes, enemies could try to defeat its members in courts. In this case, political attacks would be more likely the stronger the attacked party.

To test these alternative hypotheses we identify the vote share of the accused MP's party in the electoral district where the MP was elected. By comparing how this vote share changes over time, we can identify when the party weakens. We include electoral results from all the elections in the period covered (1979-2019).[5] Results provide evidence in favor of a political use of investigation of MPs for corruption charges. We find that, *when parties weaken*, the likelihood of political denunciation of past misbehavior increases. This result suggests that the political use of denunciation is elastic to changes in the electoral odds: when a window of opportunity opens because of a poor electoral performance,

[4] Cf. Chang, Golden and Hill (2010) for a similar classification.

[5] The only exception is the 1994 election in the aftermath of Tangentopoli. After the corruption scandal, traditional parties almost disappeared and new parties entered the electoral arena. This entirely different party system makes it impossible to compare parties' vote share before and after 1994. Notice that the exclusion of this year from our analysis stacks the deck against the first hypothesis — according to which we should expect more attacks to weakening parties — because we discard investigations related to parties that were heavily electorally damaged by Tangentopoli.

political opponents attack MPs belonging to the weakened party.

As hinted by Andreotti's quote, politicians share compromising information that can be used against each other (Tumber and Waisbord, 2004, Gambetta, 2018). Under normal circumstances the threat of revealing such information is powerful enough to prevent political enemies from blowing the whistle. Yet, when a favorable opportunity to bring down an opponent emerges, politicians might reveal such dated information or dig dirt into the MP's past to find material for a public denunciation. To provide further evidence that denunciations are politically driven, we investigate the timing of RAPs. We hypothesize that, when the leaker is a politician, the RAP is presented later (with respect to the crime) than when the denunciation does not come from a politician, and closer to elections.

Results on the timing of investigations corroborate the "digging-dirt" conjecture: we show that when the leaker is a politician, the time lag between the investigation and the alleged misconduct is significantly longer (on average, one year) than when the request is initiated by a non-political actor. We argue that this time lag is due to the political nature of the denunciation: as our results on electoral security suggest, this opportunity might present itself when the accused MP's party weakens.

Our analysis distinguishes between RAPs for crimes of corruption and opinion (e.g., slander), showing that the political incentives for tactical denunciation only play a role for the former type of allegation. When RAPs include allegations of corruption rather than opinion crimes, the likelihood of having a political whistle-blower (when parties weaken) is higher. Analogously, when dealing with corruption allegations initiated by political leakers, the time elapsed from the alleged crime increases. This result is consistent with the literature finding that revelation of corruption hurts politicians (Golden, 2006, Bågenholm, 2013, Fernández-Vázquez, Barberá and Rivero, 2016), despite its effect depending on various elements, such as social capital (Nannicini et al., 2013), electoral and candidate

selection rules (Ferraz and Finan, 2014, Rudolph and Däubler, 2016, Ceron and Mainenti, 2018), as well as voters' traits and party system features (Sberna and Vannucci, 2013, Charron and Bågenholm, 2016, Ecker, Glinitzer and Meyer, 2016, Fernández-Vázquez, Barberá and Rivero, 2016). It is also consistent with the evidence that prosecuting politicians for opinion crimes does not damage the party under attack (Van Spanje and de Vreese, 2015).

While we provide evidence of the strategic use of denunciation by politicians, clearly there are other important mechanisms that play a role. The literature has shown evidence of *fumus persecutionis* — i.e., the presumption that legal proceedings are based on an intention to impede the politician's activity — initiating from biased prosecutors (Gordon, 2009). Judicial behavior can be affected by political pressures, particularly when judges' position depends on partisan elections and judges require the support of party leaders (Hall, 1992, A. Huber and Gordon, 2004). Judicial decisions can be affected by ideology even in contexts in which judges are not elected and their careers are independent of political institutions (Ceron and Mainenti, 2015). By providing evidence of the initiation of the investigation process driven by hostile politicians we offer an additional channel through which investigations could be exploited for political reasons.

A few studies have used data on RAPs as a measure of politicians' misbehavior, focusing on Italy's First Republic, which terminated in 1994. Chang (2005) shows that intra-party competition and electoral uncertainty trigger political corruption. Consistently with our findings on RAPs for corruption crimes, Chang, Golden and Hill (2010) find that being investigated for a potentially serious crime decreases the probability of reelection of an MP in a subsequent term. Moreover, using data on RAPs, Nannicini et al. (2013) show that this effect differs by electoral districts based on voters' traits: in district with higher social capital voters are more likely to hold politicians accountable for their alleged misbehavior. Our data advances these previous studies by including information about who initiates the process of investigation, and by extending the existing evidence to RAPs

presented after 1994. Our findings suggest that the relationship between politicians' underlying corruption and RAPs is not necessarily monotone, as it varies with politicians' incentives to leak incriminating information. Thus, future work should take these incentives into account when using similar measures of corruption to make inferences about underlying transgressions.

Our paper also relates to a recently growing literature on scandals. The existing empirical literature has focused on the effects of political scandals' revelation on different outcomes, such as accountability (Ferraz and Finan, 2008, Nannicini et al., 2013, Chong et al., 2015, Cavalcanti, Daniele and Galletta, 2018), candidates' selection (Chang, Golden and Hill, 2010, Cavalcanti, Daniele and Galletta, 2018, Asquer, Golden and Hamel, 2019), politicians' behavior (Cho and Kruszewska, 2018, Daniele, Galletta and Geys, 2020) and the rise of populist parties (Foresta, 2020). A related literature has empirically scrutinized predictors of scandals' incidence such as divided governments, the number of topics covered by the media and low approval ratings (Nyhan, 2015, 2017), and dissent within the government (Balán, 2011). We provide to our knowledge the first existing dataset that investigates politically-driven denunciations where the identity of political whistleblowers is known. This allows to trace the political process underlying judicial investigations of politicians, which typically lead to scandals. As such, our paper relates to a recent theoretical literature that studies the political conditions facilitating scandals' emergence (Gratton, Holden and Kolotilin, 2017, Dziuda and Howell, 2021, Ogden and Medina, 2020, Invernizzi, 2020*a*).

The remainder of the paper proceeds as follows. Section 3.1 lays out our hypotheses. Section 3.2 and 3.3 describe the Italian Political context and the data used. Section 4.2 presents the empirical analysis. Section 3.5 discusses the results and Section 4.5 concludes.

3.1 The Strategic Determinants of Political Scandals

The view that judicial prosecutions of politicians can be initiated for political reasons is firmly entrenched in politics. In Italy, several investigations involving powerful politicians helped to foster this idea. The judicial trial that involved Giulio Andreotti from 1993 to 2004 under the accusation of corruption and collaboration with the Mafia left a controversial legacy.[6] In the aftermath of the verdict, which found Andreotti innocent, the President of the Anti-Mafia Commission Luciano Violante concluded that politics is "full of false conspiracies that are leaked for the only purpose of getting rid of political enemies."[7]

Investigations of crucial political leaders (e.g., Silvio Berlusconi) helped to radicalize this idea in more recent years. The investigation of politicians is often accompanied by scandals covered by the media, and related public protests against corruption. These can (and do) compromise the involved politician's career, even if declared innocent at the end of the judicial trial. Against this backdrop, it seems reasonable to expect opportunistic politicians to exploit investigations to achieve their political goals.

When should we expect judicial investigations to emerge as a consequence of political calculations? We hypothesize that the *electoral security* of the accused party is a crucial factor in politicians' decision to engage in politics by denunciation. That is, we expect political attacks through investigations to depend on the electoral performance of the accused MP's party. Our design allows to test for two alternative arguments that lead to opposing hypotheses regarding the effect of electoral security. First, it could be that MPs are more likely to receive political attacks when their parties weaken. Second, it could be

[6] The judicial trial against Andreotti is commonly referred to as *Processo del Secolo* (trial of the century), the outcome of which is still questioned by many (Jannuzzi and Ferrara, 2000).

[7] Chamber of Deputies, May 11, 2003. Report: http://documenti.camera.it/Leg14/BancheDati/ResocontiAssemblea/sed384/s470.htm

that attacks are more likely to be directed towards successful parties, to inhibit their way up.

The first argument is motivated by different mechanisms that have been recently explored by the formal theory literature: i) scandal fabrication by political opponents, and ii) intra-party sabotage initiated by opposing factions.

First, scandals can be triggered by a political opponent who benefits from the electoral replacement of a politician. Dziuda and Howell (2021) develop a theory of political scandal revelation according to which two parties might learn about the misbehavior of a politician, whom they are either allied or opposed to, and decide whether to publicly unleash a scandal against him or not to convince voters to replace or keep the politician. One of the results shows that scandals increase when the implicated politician is more likely to be replaced by the opposing party, i.e., when electoral security of the allied party decreases. Why is it the case? When the allied party weakens the stakes of the election increase for both parties, as the allied party is more likely to suffer and the opposing party is more likely to benefit from the sitting politician's replacement. This increase in the electoral stakes makes political opponents *more likely* to fabricate scandals.

Similarly, this argument might apply to multi-party competition, where political actors could fabricate scandals for their electoral benefit. The benefit can be direct — e.g., winning more votes as a consequence of a weaker rival — or indirect — e.g., giving a coup de grâce to a party that suffered an electoral loss, in order to open new opportunities in the long run (no matter which party will benefit from this strategy in the short term). These opportunities can include: boosting electoral volatility, generating party system instability and policy change or dismantling a party's power in a certain local area of the country (or at the national level).

Second, scandals might emerge as a consequence of within-party fights, in a quest for internal power. Golden and Chang (2001) analyze corruption-related investigations

against the Christian Democracy (DC) party in Italy during the First Republic, finding that investigations are positively correlated with the level of intra-party competition. Invernizzi (2020*a*) provides a formal mechanism to understand when intra-party competition should lead to scandals, by studying a model of elections where parties are internally divided into factions that can either help the party to win the election or sabotage each other to obtain internal power. In equilibrium, factions in the trailing party invest more resources than those in the leading party in sabotaging activities that might lead to political scandals. This happens because a lower probability of winning the election lowers the expected payoff from victory and raises the salience of the competition internal to the party. Similarly to the scandal fabrication argument, this result suggests that scandals are more likely to emerge when parties weaken, yet as the result of denunciations by same-party opponents rather than opposition parties.

Instead, the alternative argument suggests that political investigations should be used more heavily against successful parties. This mechanism is especially appropriate to explain investigations initiated by political opponents in the same electoral district of the accused MP, who are directly damaged by a successful opposing party and can only find ways alternative to the polls to weaken a strong rival.

Based on these two mechanisms, we derive the following hypothesis:

Hypothesis 3.1 (Electoral Security)**.** *The likelihood that a RAP is initiated by a political actor rather than a non-political one (a) increases (b) decreases as the party of the accused MP loses electoral support.*

Our next hypothesis investigates how political incentives are related to the timing of investigations. If politicians attack their opponents with RAPs, when should we expect them to do so? The literature provides empirical and theoretical evidence on the importance of timing of information release in elections. Gratton, Holden and Kolotilin (2017) analyze a sender-receiver game connecting the timing of information release with voter

beliefs prior to elections. The model derives an equilibrium in which fabricated scandals are only released close to the election date, and empirical data on the release of US presidential scandals confirm their equilibrium prediction.

Timing of message delivery has also been the subject of field and lab experiments. In a study of the effect of phone calls by volunteers on voter turnout, Nickerson (2007) shows that calls made during the final days prior to the election are most effective in mobilizing voters. Similarly, Invernizzi (2020*b*) shows with a controlled experiment that recency bias — i.e., the tendency of voters to follow information when it is provided close to the voting decision — largely affects collective decision making.

Overall, the evidence from the literature suggests that in our setting it is plausible to expect RAPs initiated by political leakers to be presented closer to the election, motivating the following hypothesis.

Hypothesis 3.2 (Timing with respect to Election)**.** *When the investigation is initiated by a political leaker, the RAP is presented closer to the election than when the investigation is not political.*

Furthermore, we hypothesize that — when investigations are triggered by political enemies — we should observe a longer time lag between the MP's alleged misconduct and when the date of the RAP. When a politician becomes aware of the misconduct of a political rival, she could decide whether to reveal such misbehavior immediately or to keep the information for the time in which the scandal could be more profitably revealed. Similarly, when a window of opportunity opens, political opponents might search into the MP's past to reveal evidence of corruption, which would result in more time elapsed from the alleged misconduct.

One potential confounding factor is that credible political corruptions cases take long to assemble. This would increase the time lag between the denounced events and when the case is brought before the Chamber, simply because of feasibility constraints related

to the legal process. However, this constraint should be equally binding for political and non-political actors initiating an investigation. Hence, *ceteris paribus*, we should consider a longer time lag for political rather than non-political actors as evidence of politicization.

Hypothesis 3.3 (Digging-dirt Process)**.** *When the investigation is initiated by a political leaker, the time lag between the alleged events and the date of the RAP is longer than when the investigation is not political.*

So far we implicitly assumed that denunciations produce negative electoral effects for the party affected by the investigation. However, this is not always the case and depends on the type of crime. While there is evidence that voters punish corrupt politicians, this is not necessarily the case for politicians engaging in other crimes. For example, Van Spanje and de Vreese (2015) show that hate speech prosecution against the Freedom Party in The Netherlands actually enhanced that party's appeal with positive effects in terms of electoral performance. In a comparative analysis involving Belgium, France, Germany and the Netherlands, Jacobs and Van Spanje (2020) found that hate speech prosecution did not undermine the electoral performance of anti-immigration parties. Similar findings apply to Finland as well (Askola, 2015). More generally, politicians charged with opinion crimes might enjoy higher reputation among their constituencies, who share similar opinions. Furthermore, prosecuted politicians can portray themselves as martyrs for freedom of speech (Van Spanje and de Vreese, 2015), thus increasing their popularity among voters who deem as illegitimate a trial based on opinions (Askola, 2015).

This evidence suggests that investigations related to corruption should be more dangerous than those based on opinion crimes for the reputation of the involved politicians. Chang, Golden and Hill (2010) show that this is indeed the case for Italian MPs when allegations of wrongdoings are covered by the media: in particular, they show that major crimes (often linked to corruption) reduce the likelihood of re-election for MPs hit by a RAP investigation, while soft accusations of opinion crimes do not — despite the fact

that minor charges involving opinion crimes are especially likely to arise during the process of political campaigning. Thus, if only corruption crimes have the power to produce damages, we hypothesize that we should observe evidence of strategic politicization of investigations only with respect to corruption crimes.

Hypothesis 3.4 (Politicization of Corruption vs Opinion crimes)**.** *The political use of investigations (3.1 - 3.3) involves corruption crimes but not opinion crimes.*

3.2 Background

Judicial activity investigating MPs is a salient issue in Italy, as public prosecutors have played a prominent role in the Italian political system. Their popularity and impact became particularly important after 1992, when the Mani Pulite (Clean Hands) judicial inquiry shed light on the illegal links between politics and business and revealed the political corruption permeating the political system, which resulted in the *Tangentopoli* corruption scandal. This section goes over the most relevant institutional details concerning electoral competition and the RAPs' procedures, to shed light on how these institutions might affect the political use of judicial investigations.

3.2.1 Italian Electoral and Party System

The time frame 1983-2019 was selected to have a balanced dataset covering both Italy's First Republic, which defines the political period starting from World War II and ending with the elections of 1994, and the current Second Republic, which begins with the 1994 election under a new electoral and party system.

During the First Republic, Italy's electoral system was based on proportional representation. This proportional representation (PR) open-list system emphasized intraparty competition among candidates (Carey and Shugart, 1995) and encouraged party factionalism (Chang, 2005). Depending on the district magnitude, voters were allowed to cast

up to four preference votes. Therefore, the way in which candidates were elected from a list was completely determined by the individual preference votes cast by the party's voters in a given district. The use of preference votes (and the related intraparty competition between factions) was blamed as a source of corruption and vote of exchange (**?**). At the local level, this produced a robust system of power in which the same parties and candidates ruled for several years in certain areas of the country, taking advantage of established local strongholds that secured them re-election and granted them power.

During most of this period, Italy's multiparty system was dominated by the Christian Democratic Party (DC), the Italian Communist Party (PCI), and a number of small yet influential parties. In the 1980s, the Italian political system started to face broad transformations. After decades of party system stability and dominance of the DC, new cleavages transformed the political space, opening opportunities for green, ethno-regionalist as well as populist and radical parties which partially originated as a reaction to the "cartelization" that characterized the First Republic, and that were fueled by waves of corruption scandals (often linked to parties' public funding).

In 1993, an electoral reform modified the electoral system from pure PR to a mixed-member system in which three-quarters of the Chamber seats (475) were allocated in single-seat-district via plurality, and the remaining one-quarter (155) via party lists through proportional representation. Together with the wave of judicial prosecution of corrupted officials that involved most political parties, the new electoral law contributed to fundamentally change the party system of the First Republic. The DC, riven by scandals, imploded and was replaced by the much smaller Italian People's Party (PPI). More generally, the Italian political system — which had previously been dominated by parties of the center — became polarized between parties of the right and left.[8] A new electoral

[8] The political center was left to be divided by various short-lived multiparty alliances: for example, at the turn of the 21st century, the center-right House of Freedoms and the center-left Olive Tree.

law (named *Porcellum*, later deemed unconstitutional) overturned this system in 2005 by restoring full proportional representation. However, the law also allocated a number of bonus seats in the Chamber of Deputies to the winning coalition — thus guaranteeing a majority for the winners.

Our dataset includes general elections held from 1979 until 2018, to match the time frame of investigations (1983-2019). More precisely, we match each MP affected by an investigation to the results of his/her party in the district where the MP was elected: in particular, we compare the last two elections before the RAP was sent in order to measure the electoral performance of the party in that district.[9]

We are interested in knowing whether a negative performance of the party (i.e., a declining vote share) in a given district triggers political RAPs, or whether these investigations are more likely to take place when the MP's party is performing well (3.1). Given the incentives provided by the Italian electoral institutions, it is reasonable to expect that political attacks (through RAPs) are aimed at weakening the party *per se*, rather than winning the seat of the accused MP's district. Indeed, neither the multi-member district system of the First Republic nor the closed list (and single-member district) system of the Second Republic suggest a zero-sum game logic whereby weakening a rival directly helps to obtain a seat. Rather, given that the party is weakening in a certain district, it seems plausible that political enemies attack the MP there — where the attack is more likely to be consequential. This logic is coherent with the idea, outlined in the previous section, that political enemies might initiate RAPs to benefit (either directly or indirectly) in the long run.

[9] We cover national elections held in 1979, 1983, 1987, 1992, 1996, 2001, 2006, 2008, 2013 and 2018, leaving aside the 1994 for the reasons discussed above.

3.2.2 RAPs: Rules and Procedures

The Italian judiciary is responsible for investigating crimes perpetrated by members of parliament. MPs, however, are protected from prosecution by parliamentary immunity unless that immunity is revoked. How does the judicial process work? In order to proceed with the investigation of an MP, the public prosecutor who is investigating the case need to send a formal request (RAP) to the Chamber of Deputies, before proceeding with the investigation. Once the request is received, the President of the Chamber forwards the request to a special committee ("Giunta per le Autorizzazioni"). The committee is composed of 21 deputies who evaluate the legitimacy of the request to proceed with the investigation. Based on the committee's report, the Chamber grants or denies the authorization, and the final decision is communicated to the prosecutor.

Our dataset includes requests sent both before and after 1993, when a constitutional reform changed the reasons to request the authorization from the Chamber of Deputies. Before the reform, prosecutors were required to present all the judicial documents to the Chamber, together with the request to lift immunity of the investigated MP. After the reform, enacted in the aftermath of the *Tangentopoli* scandal, prosecutors do not need an authorization from the legislative body for criminal proceedings against deputies.[10] The authorization is still needed for warrant of arrest, personal search, or other measures such as wiretapping.

Figure 3.1 shows the number of RAPs that are presented in each legislative period covered by our study (black bars). As one might expect, there is a clear drop in the overall number of RAPs starting from the 12th legislature (which marks the beginning of the Second Republic), which is a consequence of the 1993 constitutional reform that limits the reasons to request such authorizations. Notice that observing fewer RAPs after 1993

[10] Constitutional Law 3/1993, enacted on October 29th.

does not mean that the number of investigations dropped as well. Notwithstanding the procedural changes introduced by the reform, our analysis below shows that results are not affected by it.[11]

Notice that RAPs measure *allegations* of MPs' wrongdoing, not *convictions*. While there is no data available on judicial convictions, we know that the Chamber failed to lift immunity for most deputies. The light bars in Figure3.1 display the number of RAPs that are granted by the Chamber of Deputies in each legislative period. Only few RAPs are conceded by the Chamber — especially during the First Republic — thereby allowing the judiciary to proceed. This obviously implies that an even smaller proportion of these allegations manages to reach the judicial stage. This might present an issue of measurement validity if we used RAPs as a measure of MPs' underlying corruption. Because our goal is to provide evidence of the political use of RAPs, we do not need the final verdict: indeed, there is evidence that RAPs compromise the involved politicians' career even if declared innocent at the end of the judicial trial.[12]

We collect data based on three fundamental sources, related to the RAPs. First, the request itself, which includes the name of the investigated MP and other information, such as the type of crime, typically in a concise format. Second, the Chamber Committee's report about the RAP (*Relazione della Giunta per le Autorizzazioni a Procedere*), which summarizes the information included in the RAP and grants (or denies) the authorization to proceed with the investigation. Our final source is the minutes of the Committee meeting, which allow to retrieve more information regarding the investigation, when this was not included in the Committee's report. Information about the leaker or how the investigation initiated was provided either in the original request, in the Committee's final report

[11] Our results remain virtually unchanged when including in our model a dummy variable to account for requests sent after 1993.

[12] It would be interesting to compare the outcome of judicial investigations for political vs. non political RAPs. Observing a higher fraction of non-political RAPs granted would provide further evidence of the extensive margin of "politicization" of the investigation process.

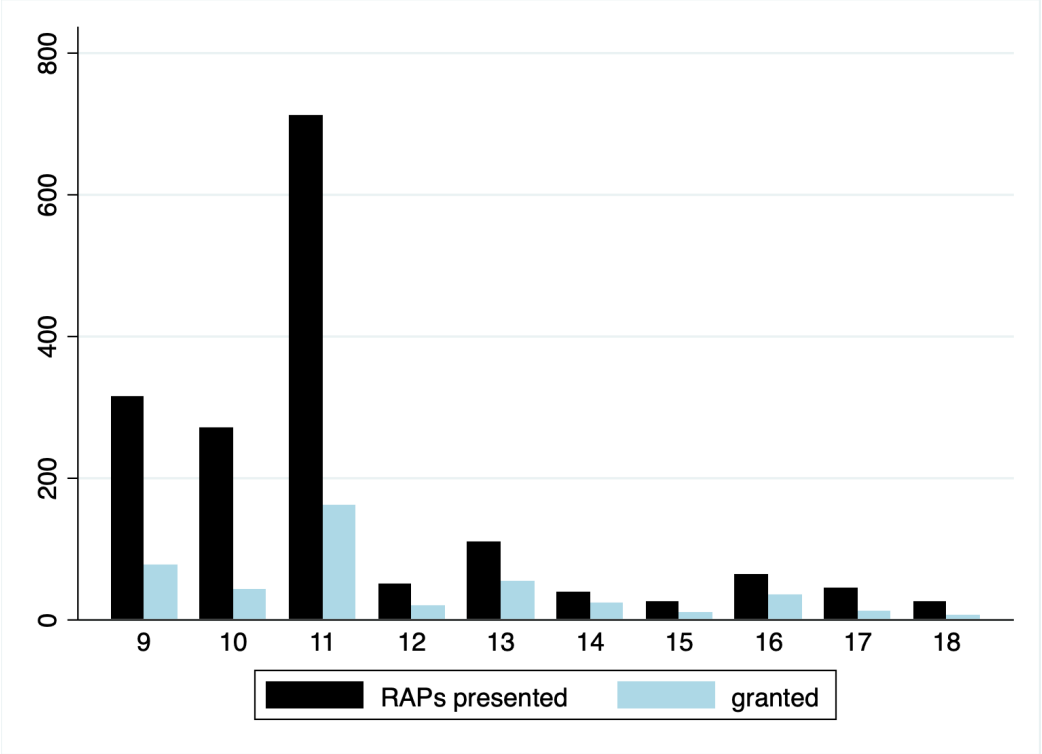

Figure 3.1: Frequency of RAPs presented (black bars) and granted (light bars) by legislature.

or in the minutes of the Committee meeting.[13]

3.3 Data

Over the period 1983-2019, public prosecutors submitted 726 RAPs involving 1,655 MPs to remove their parliamentary immunity and proceed with their investigation. We build our dataset based on these RAPs. For each legislative term, our unit of analysis is the MP affected by each RAP. While a RAP could refer to multiple alleged crimes, each request is related to a single investigation. Furthermore, while multiple crimes could be under investigations in the same document, all of them refer to the same type (corruption or opinion). When a RAP is directed to multiple MPs, each politician represents a separate

[13] We include in the Appendix an original example (in Italian) of the Committee's final report.

observation in our dataset. Finally, each MP could be affected by different RAPs over time and we created multiple observations accordingly.

In terms of episodes of alleged misbehavior, our data consists of 1125 episodes involving 451 MPs. We consider two types of crimes: corruption and opinion. Of the episodes composing our dataset, 597 refer to corruption charges and 528 to opinion ones. We do not consider 530 requests linked with other crimes such as private violence, murder and participation to organized crime (Mafia or terrorism) because these charges follow specific procedures that provide additional resources and opportunities to courts, thus minimizing the incentives for the political usage of RAPs. Specifically, the Constitution (art. 68) indicates that prosecutors do not need authorization from the Chamber to prosecute an MP if the crime requires mandatory arrest ("arresto obbligatorio in flagranza"), which renders RAPs unnecessary.[14]

The list of corruption crimes includes information regarding requests to lift immunity for MPs charged with public administration improprieties, such as misappropriation and abuse of power, in addition to illegal party funding, which is frequently related to other public administration crimes in Italy (Rhodes, 1997). Conversely, the list of crimes of opinions include slander, defamation, insult, contempt or incitement to disobey the law.[15]

Figure 3.2 shows, for each legislature, the frequency of RAPs for corruption crimes (black bars) versus opinion crimes (light bars). As one might expect, the 11th legislature includes an exceptionally high number of corruption RAPs: this corresponds to the Tangentopoli investigation, when 35 percent of deputies are named in RAPs for corruption

[14] The penal code (art. 380) lists all the crimes requiring mandatory arrest, among which the participation and promotion of Mafia organizations.

[15] We code as opinion crimes charges listed in the following articles of the Italian penal code: 278, 290, 336, 368, 414, 415, 594, 595, 612, 656, as well as infringements of laws on defamation via press/mass media: art. 13 and art. 21 law 47 (08/02/1948) or art. 30 law 223 (06/08/1990); we code as corruption crimes charges related to articles 314, 317, 318, 319, 320, 321, 322, 323, 324, 328, 333, 317-bis, 319-bis, 319-ter, and 319-quarter of the Italian penal code as well as infringements of laws on public funding of parties: art. 7 law 195 (02/05/1974) and art. 4 law 659 (18/11/1981)

crimes.[16]

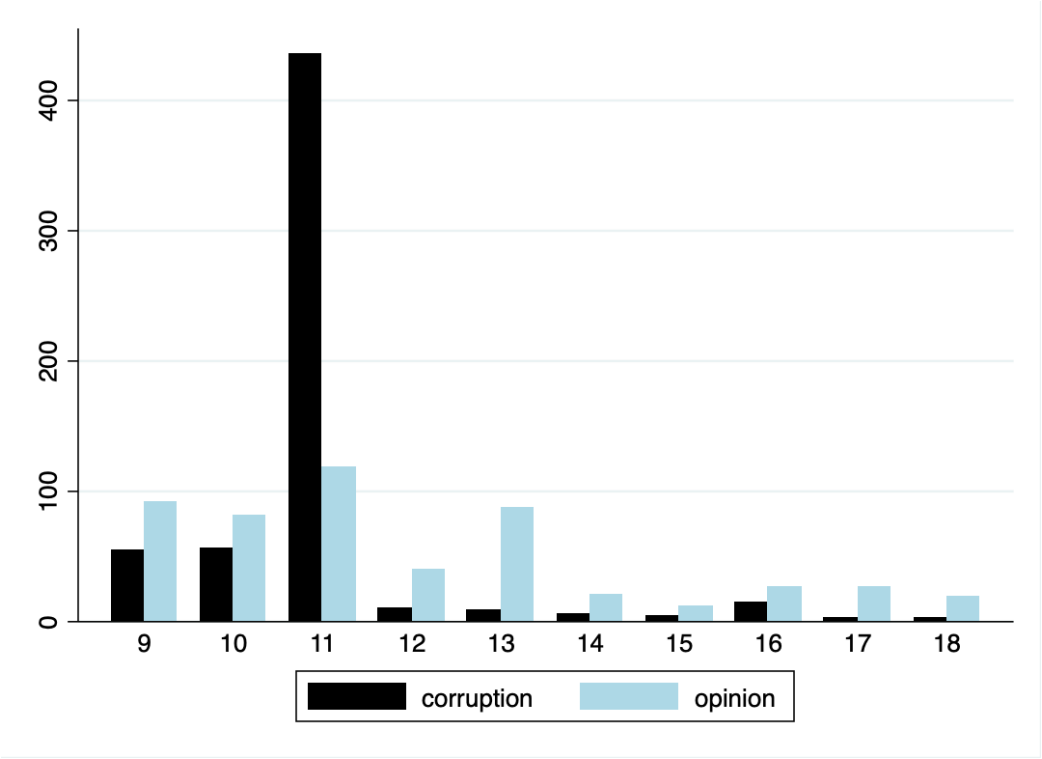

Figure 3.2: Number of RAPs presented by type of allegation and legislature.

To shed light on whether investigations are politically driven, we gather information on the citizen whose contribution in the investigation is relevant to generate the RAP. Depending on the investigation, such crucial contribution might come from entrepreneurs, police officers, public administration workers or managers, private citizens, or political actors (MPs, local politicians, head or members of political associations, etc.).

Out of 1125 MPs investigated for corruption or opinion crimes, in 398 cases (35.4%) the leaker is a political actor (175 times with respect to corruption and 223 times with respect to crimes of opinion). Based on this, we build the variable Political Leaker, which is a dummy equal to one when the leaker of the investigation (or at least one leaker in

[16] The extraordinary number of corruption RAPs during the 11th legislature suggests that it is crucial to control for the specific peculiarities of each legislature. To do so, we include in our model fixed effects by legislative term. Notice also that our results remain virtually unchanged when including a dummy variable to specifically account for requests sent during Tangentopoli, i.e., from 1992 to 1994.

case of multiple leakers) is a political actor, and zero when no leaker is a political actor, or when there is no clear leaker indicated in the RAP — the latter being usually the case when the investigation is independently initiated by the police or the judiciary. Figure 3.3 plots, for each legislature, the frequency of RAPs initiated by a political leaker (black bars) versus a non-political one (light bars).

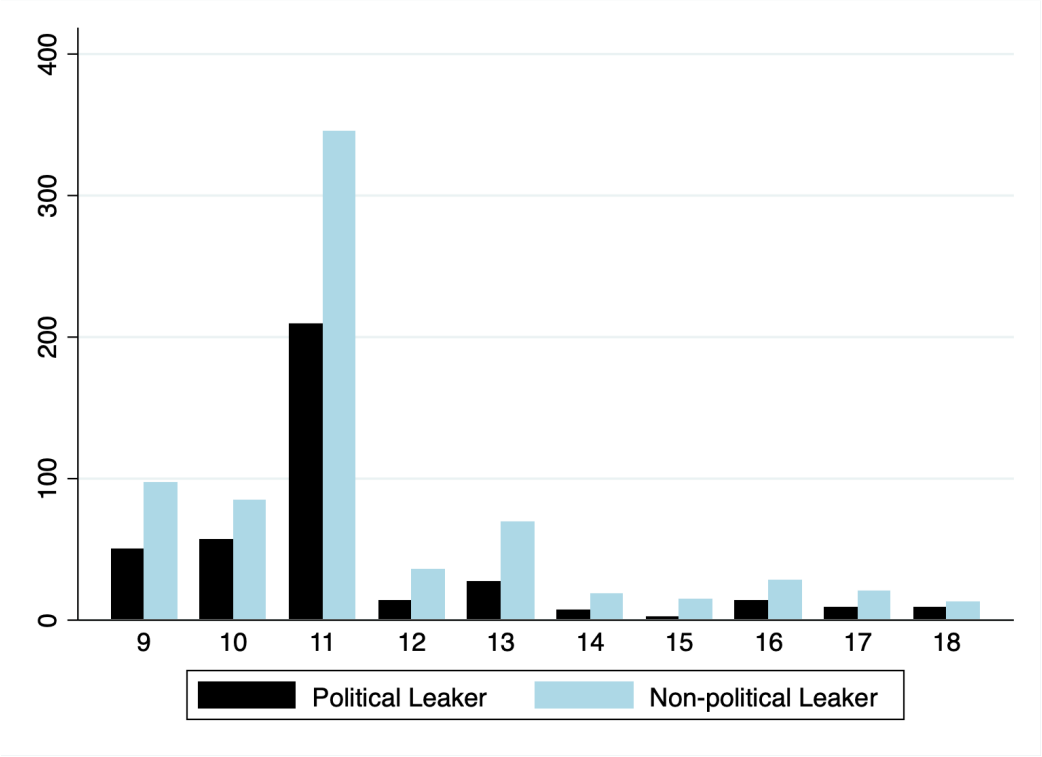

Figure 3.3: Number of RAPs presented by type of leaker and legislature.

3.4 Results

3.4.1 What Drives Political Investigations?

We start by asking whether electoral concerns affect the likelihood that investigations are initiated by a political leaker. Following 3.1, we expect that political leakers are motivated by electoral concerns: when the MP's party weakens/strengthens electorally, this opens a

window of opportunity for political opponents to attack the deputy. To test this hypothesis, we employ a logistic regression where the dependent variable is the likelihood that a RAP is initiated by a political leaker. That is, of all the requests against MPs in our data we analyze how many investigations were initiated by political leaker.[17]

Our main independent variable measures the electoral performance of a party in a given district: for each MP hit by a RAP, ΔVOT_{ijt} is equal to the difference between the vote share of his/her party at time $t-1$ and the vote share at time t, where t indicates the last election before the RAP is sent. Higher (lower) values indicate that the party is losing (gaining) support in the electoral district that elected the MP. Our baseline specification is

$$POL_{ijt} = \alpha_t + \beta \Delta VOT_{ijt} + \gamma OPC_{ijt} + \delta \Delta VOT_{ijt} \cdot OPC_{ijt} + \epsilon_{ijt}, \tag{3.1}$$

where ΔVOT_{ijt} represents the electoral loss of MP i's party in district j at time t. We account for the moderating role of different types of crimes testing the interaction between ΔVOT_{ijt} and the dummy variable OPC_{ijt}, which is equal to 1 when the RAP is related to an opinion crime, and 0 for a corruption crime. POL_{ijt} is a dummy which takes value 1 when the RAP against MP i in district j at time t is initiated by a political leaker. Finally α_t refers to time fixed effects (by legislative term).

Table 3.1 summarizes the results. Column 1 refers to the most parsimonious specification, which only includes legislatures fixed effects.[18] The likelihood of observing a RAP related to an investigation driven by a political leaker (rather than a non-political one) is higher when the electoral performance of the MP's party is declining.[19] Remarkably, the

[17] As we discuss in Section 3.5, a related question that we do not consider in this study is whether losing electoral support could trigger RAPs initiated by any actor (not only political ones).

[18] The results are robust to using party fixed effects as well: see Table B.1 in Appendix. Finally, results are also robust to adding district fixed effects: see Table B.2 in Appendix.

[19] When testing the potential quadratic effect of the electoral performance we find no significant effect for the quadratic term of electoral loss, suggesting that we are more likely to find political leakers only when parties weaken and not when they are gaining support.

significant coefficient of the interaction term suggests that this effect is conditional on the type of crime and it holds only when dealing with corruption crimes.

The sign and significance of the interaction term remains unaltered even when adding additional regressors. It could be that MPs belonging to stronger parties in a district are immune to political attacks, even conditioning of an electoral loss. Column 2 adds as controls the variable (i) Party Size, which is the percentage of votes that the MP's party obtained at the national level in the last election before the RAP was sent to the Chamber, (ii) Government, which is a dummy equal to 1 when the politician hit by the RAP is a member of a party in office, and (iii) External Support, which is equal to 1 if that party was externally supporting the cabinet.

Similarly, accounting for the salience of corruption scandals in the political system does not alter the impact of the MP's party electoral loss. This is shown in the third column, where we control for the variable Corruption Salience, which is based on the hand-coding of legislative speeches, and records the saliency of the corruption issue in parliamentary debates.[20] From column 3 we notice that a one standard deviation increase from the mean of Electoral Loss increases the likelihood of a RAP driven by a political leaker by 7.1% (which corresponds to a 20.3% increase in relative terms); conversely, this effect is no longer statistically significant for crimes of opinion.

The effect that (alleged) corruption crimes are exploited against MPs when their party is weakening, while opinion crimes are not, underscores an interesting component of the leaker's incentives. Intuitively, if the purpose is to weaken an electoral adversary, exposing a MP with a RAP (which is typically covered by the media) for corruption likely

[20] More specifically, the variable Corruption Salience reports the average percentage of sentences pronounced during each investiture debates of Italian government (almost every year) emphasizing the need to eliminate corruption in political life. This variable varies across years, though on average the salience of corruption in investiture debates is overall rather similar in the First and Second Republic. This variable is built following a strategy similar to that of the Comparative Manifesto Project, applying such approach to speeches delivered by party leaders during the investiture debates.(Ceron and Mainenti, 2018)

Table 3.1: The Impact of Electoral Loss on Investigations Driven by a Political Leaker

	(1)	(2)	(3)
Electoral Loss (ΔVOT_{ijt})	0.041**	0.053**	0.053**
	[0.020]	[0.022]	[0.022]
Opinion Crime	0.965***	0.868***	0.867***
	[0.169]	[0.192]	[0.193]
Electoral Loss × Opinion Crime	-0.050**	-0.055**	-0.055**
	[0.028]	[0.029]	[0.029]
Party Size		-0.011*	-0.011*
		[0.006]	[0.006]
Government		-0.027	-0.028
		[0.197]	[0.197]
External Support		-0.438	-0.449
		[0.488]	[0.496]
Corruption Salience			0.001
			[0.049]
Legislative Terms FE	Yes	Yes	Yes
Observations	951	951	951

Notes: Logit estimations; coefficients reported. Dependent variable: dummy equal to one if the member of Parliament received a request for removal of parliamentary immunity initiated by a political actor. Standard errors are indicated in brackets. *** p<0.01, ** p<0.05, * p<0.1.

triggers a negative reaction from attentive voters. Displaying opinion crimes, on the other hand, could simply reinforce the MP's reputation among voters who likely share the same beliefs (Van Spanje and de Vreese, 2015, Jacobs and Van Spanje, 2020).

Why, then, do politicians initiate more opinion RAPs, if not for hurting political adversaries? The significant coefficient associated to the variable Opinion Crime means that politicians tend to rely on this type of allegations: as we discuss in Section 3.5, opinion RAPs are mainly exploited by politicians with the aim of mobilizing their electorate (rather than weakening a rival's reputation) and defending their own reputation against

allegations. As such, charges of opinion crimes are especially likely to arise during the process of political campaigning (Chang, Golden and Hill, 2010). For example, the modal motive for initiating a political opinion RAP is *defamation towards false accusations*.[21] Thus, rather than being an attempt to bring down a political opponent, opinion RAPs often reflect an attempt to defend one's reputation against such attacks.

3.4.2 Are Political RAPs Released Closer to Elections?

If investigations reflect political motives, then MPs' opponents could leak damaging information in the midst of the electoral campaign, when their damaging effect is arguably stronger (3.2). The literature has provided evidence of the importance of timing of information released during electoral campaigns, showing that scandals are indeed released closer to elections (e.g., Gratton, Holden and Kolotilin, 2017); this suggests that in our setting we should expect RAPs initiated by political leakers to be presented closer to elections.

To test 3.2, we employ an OLS regression where the dependent variable is the number of days elapsed between the date of the RAP and the next election. The following is our baseline specification:

$$Election_{ijt} = \alpha_t + \beta POL_{ijt} + \gamma OPC_{ijt} + \delta POL_{ijt} \cdot OPC_{ijt} + \eta \Delta VOT_{ijt} + \epsilon_{ijt}, \qquad (3.2)$$

where the main regressor of interest is the dummy POL_{ijt}, which takes value 1 when the RAP against MP i in district j at time t is initiated by a political leaker. POL_{ijt} is interacted, as before, with the type of crime: OPC_{ijt} is a dummy for opinion crimes. ΔVOT_{ijt} is the electoral loss of MP i's party in district j at time t, and α_t refers to time fixed effects by legislative term.

[21] Section 3.5 provides an example of this type of RAPs.

Table 3.2 summarizes the results, showing that having RAPs initiated by political leakers does not affect the timing of the requests; the effect is not statistically significant for either corruption or opinion crimes. The fact that we do not find evidence in favor of 3.2 is interesting; we conjecture that this might happen because the leaker does not have complete control over the timing of the investigations (and obviously the timing of elections).

This null finding is plausible for two reasons. First, Italy is an outlier for the elevated number of early elections, which might reduce the effectiveness of the strategic use of judicial investigations. Second, even if the date of the election was certain, it would still be difficult for a political opponent to forecast the amount of time needed for a scandal to outbreak and have an electoral effect.

3.4.3 Additional Evidence of Politicization: the Digging-Dirt Process

In this section we investigate further the political use of judicial investigations. To do so, we draw evidence from the timing of the RAPs. Our data includes the date of when the request is presented to the committee and that of the alleged crime. In line with 3.3, we expect that politicians who want to get rid of their political enemies take advantage of judicial prosecutions by leaking incriminating evidence of old episodes of corruption.

To test our "digging-dirt" hypothesis, in our baseline specification we regress the variable $DAYS_{ijt}$ — i.e., the number of days elapsed from the crime to the date of the RAP — on our regressor of interest, i.e., the dummy indicating whether the leaker is political:

$$DAYS_{ijt} = \alpha_t + \beta POL_{ijt} + \gamma OPC_{ijt} + \delta POL_{ijt} \cdot OPC_{ijt} + \eta \Delta VOT_{ijt} + \epsilon_{ijt}, \tag{3.3}$$

where as before POL_{ijt} is a dummy which takes value 1 when the RAP against MP i in

Table 3.2: Political Investigations and Timing of Elections

	(1)	(2)	(3)
Political Leaker	37.822	33.289	39.412
	[28.175]	[27.511]	[26.846]
Opinion Crime	21.244	-44.056	-51.182*
	[29.330]	[31.481]	[30.721]
Political Leaker × Opinion Crime	6.554	6.839	-5.368
	[43.138]	[42.063]	[41.062]
Electoral Loss	6.813***	6.149**	5.020**
	[2.307]	[2.424]	[2.369]
Party Size		-0.165	-0.289
		[0.879]	[0.858]
Government		-172.976***	-173.036***
		[30.009]	[29.267]
External Support		-405.056***	-324.382***
		[68.150]	[67.476]
Corruption Salience			47.511***
			[6.847]
Legislative Terms FE	Yes	Yes	Yes
Observations	933	933	933

Notes: OLS estimations; coefficients reported. Dependent variable: time (days) elapsed between RAP and next election. Standard errors are indicated in brackets. *** p<0.01, ** p<0.05, * p<0.1.

district j at time t is initiated by a political leaker. POL_{ijt} is interacted, as before, with the type of crime: OPC_{ijt} is a dummy for opinion crimes. ΔVOT_{ijt} is the electoral loss of MP i's party in district j at time t, and α_t refers to time fixed effects by legislative term.

Results from an OLS estimation are reported in Table 3.3. The coefficient of Political Leaker clearly shows that political leakers do tend to dig back in time. The average time between the alleged corruption crime and the political RAP is about 6 years. In line with 3.3, this time lag is significantly larger than for non-politically initiated corruption RAPs, both statistically and substantively (433 days larger).

By contrast, the elapsed time for opinion crime is about 2 years for non-political opinion crimes and less than one year for political opinion crimes, which is consistent with the frequent use of the latter during political campaigns. Among opinion RAPs, the difference between politically driven and non-politically driven ones is positive (+48 days) but not statistically significant. The results are robust also when including the control variables discussed above or when using party fixed effects.[22]

Our results in favor of the digging-dirt conjecture are further supported by qualitative interviews to politicians involved in the Tangentopoli scandal.[23] When asked about the trial against Andreotti, Luciano Violante (PCI) — former Head of the Chamber of Deputies — says that "despite the trial initiated in the 1980s, it was only triggered after the Mani Pulite investigation, when traditional parties had already been dismantled."[24] Furthermore, Violante highlights that entrepreneurs had been reporting corruption crimes for ages, well before the rise of the Tangentopoli scandal, so that this scandal only revealed a latent corruption that was already common knowledge.

Similarly, when discussing the Tangentopoli investigations, the former Head of State Francesco Cossiga (DC) reports the words of a very famous businessman (name omitted) claiming that *"prosecutors charged him with crimes dating 4-5 years back in time, that were clearly the result of wiretapping that began long before."*[25] According to other interviews (amongst them, the anchorman Enrico Mentana or the prosecutor Gherardo Colombo), those judicial investigations initiated indeed only when all the main Italian parties started to face an electoral crisis, losing voters' support.[26] This anecdotal evidence provides sup-

[22] See Table B.3 in the Appendix.

[23] Cf. Andrea Pamparana (2004) "Mani Pulite," produced by Giovanni Di Clemente, published by Istituto Luce. The interviews mentioned in this paper are available at:
https://www.youtube.com/watch?v=rPaqLj_x6zY.

[24] The original interview can be listened from minute 46 onwards.

[25] The original interview can be listened from minute 11:30 onwards.

[26] The original interviews can be listened from minute 13 onwards.

Table 3.3: Political Investigations and Time Elapsed from Crime (Days)

	(1)	(2)	(3)
Political Leaker	438.534***	437.027***	433.114***
	[83.711]	[83.898]	[83.912]
Opinion Crime	-1,001.306***	-1,015.158***	-1,012.175***
	[86.864]	[95.220]	[95.204]
Political Leaker × Opinion Crime	-396.995***	-395.678***	-385.596***
	[127.729]	[127.784]	[127.950]
Electoral Loss	-6.571	-6.250	-5.666
	[6.527]	[6.969]	[6.979]
Party Size		-1.855	-1.747
		[2.679]	[2.679]
Government		16.919	15.208
		[91.750]	[91.718]
External Support		341.574*	289.595
		[199.521]	[203.187]
Corruption Salience			-28.740
			[21.496]
Constant	1,719.578***	1,752.027***	1,880.280***
	[90.879]	[125.721]	[158.094]
Legislative Terms FE	Yes	Yes	Yes
Observations	907	907	907

Notes: OLS estimations; coefficients reported. Dependent variable: time elapsed between (alleged) crime and RAP. Standard errors are indicated in brackets. *** p<0.01, ** p<0.05, * p<0.1.

port in favor of the argument that investigations against MPs are politicized.

3.4.4 Digging-dirt Closer to Elections?

While we find no evidence that political RAPs affect the timing of the requests with respect to elections (Table 3.2), it could be that the incentive to release *old* compromising information closer to an election is stronger for political opponents than for non-political

ones.

If denunciations are political, we might expect leakers to plan the timing of information release to judicial authority such that the resulting RAPs fall closer to election dates. By only searching among recent events, leakers might not find enough rumors of misconduct to be used during the election campaign. Conversely, by digging-dirt back in time, political leakers might take advantage of their rivals' past misbehavior to generate timely investigations against them closer to the election in order to damage their electoral performance. Therefore, we might expect that RAPs initiated by political leakers refer to events that took place further back in time than non-political RAPs, especially when these investigations are disclosed closer to the election day.

Table 3.4 shows a three-way interaction involving Political Leaker, the type of crime and Days to Election. The positive and significant interaction suggests that, when RAPs involve corruption crimes, *the difference in digging-back between political and non-political leakers is more pronounced closer to election day.*[27] This result might be interpreted as follows. As elections approach, political leakers might not find enough rumors of misconduct by looking at recent events. Conversely, by digging-dirt back in time, they might exploit their rivals' past misbehavior to generate timely investigations against them in order to damage their electoral performance.

The first panel of Figure 3.4 shows that RAPs related to corruption crimes that are (i) sent closer to an election and (ii) initiated by a political leaker tend to refer to older crimes; the marginal effect of a political leaker on the gap between the crime and the RAP indicates that politically-initiated RAPs issued in the last month before election day date approximately 680-700 days back in time compared to politically-initiated RAP issued earlier during the legislature.[28] Conversely, the marginal effects suggest that there are no

[27] See also the marginal effects reported in Figure 2, in the Appendix.

[28] See Figure B.1 in the Appendix for marginal effects.

Table 3.4: Time Elapsed from Crime

	(1)	(2)	(3)
Political Leaker	675.451***	708.838***	700.575***
	[151.454]	[145.165]	[145.400]
Days to Election	-0.051	-0.044	-0.011
	[0.146]	[0.148]	[0.152]
Political Leaker × Days to Election	-0.600**	-0.636**	-0.624**
	[0.289]	[0.277]	[0.277]
Opinion Crime	-1,021.163***	-1,116.021***	-1,103.354***
	[139.831]	[153.763]	[154.285]
Political Leaker × Opinion Crime	-674.005***	-636.482***	-617.722***
	[218.516]	[231.674]	[232.434]
Opinion Crime × Days to Election	0.116	0.113	0.099
	[0.172]	[0.183]	[0.183]
Political Leaker × Opinion Crime × Days to Election	0.590*	0.604*	0.584*
	[0.327]	[0.329]	[0.329]
Electoral Loss		-4.883	-4.577
		[7.433]	[7.439]
Party Size		-2.016	-1.941
		[2.712]	[2.713]
Government		26.482	30.142
		[95.754]	[95.824]
External Support		413.980*	385.003*
		[211.317]	[213.297]
Corruption Salience			-22.374
			[22.388]
Constant	1,719.578***	1,752.027***	1,880.280***
	[90.879]	[125.721]	[158.094]
Legislative Terms FE	Yes	Yes	Yes
Observations	1,021	892	892

Notes: OLS estimations; coefficients reported. Dependent variable: time elapsed between (alleged) crime and RAP. Standard errors are indicated in brackets. *** p<0.01, ** p<0.05, * p<0.1.

differences between RAPs initiated by political or non-political leakers, when RAPs are presented to the Chamber long before the election. In other words, when we are far from the election, political leakers are no longer more willing to dig back in time compared to non-political leakers. Even if a political leaker does not have a full control on the timing of the RAP (as discussed above), we find evidence in favor of the idea that leakers attempt to affect such process, digging dirt and releasing information especially when new elections are approaching.

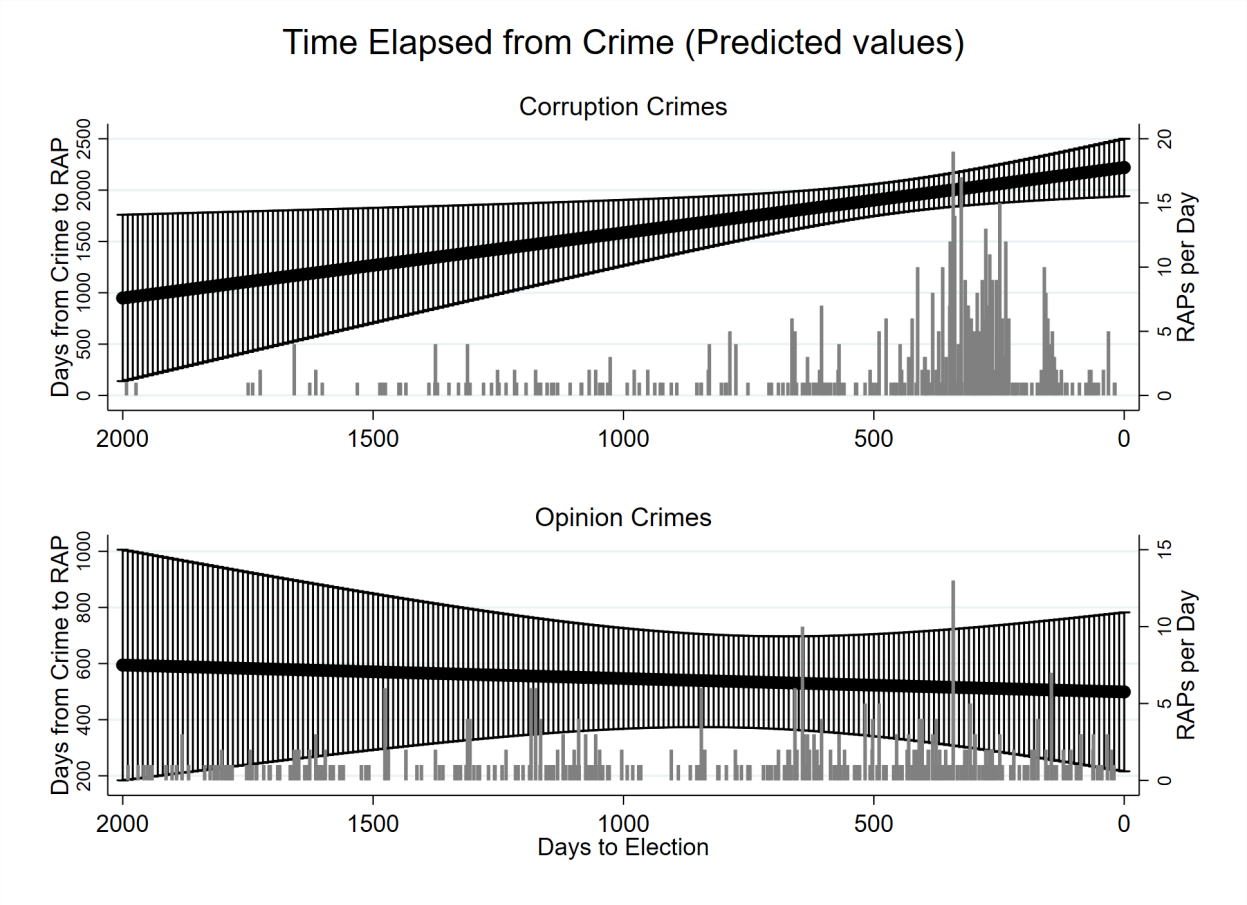

Figure 3.4: Predicted values of time elapsed from crime in days, for both corruption and opinion crimes.

The second panel in Figure 3.4 shows that there is no effect for opinion crimes (the line is flat and the marginal effect is never statistically significant). Notice that this difference

does not seem related to the time needed for the crime to be statute barred. For instance, both corruption and defamation (an opinion crime) are statute barred in the same amount of time (6 years). Similarly, existing work suggests that opinion crimes can arise due to the process of political campaigning (Chang, Golden and Hill, 2010). Our findings differ as on average RAPs are sent closer to the election when they are related to corruption crimes (471 days) rather than opinion crimes (841 days).

3.5 Discussion

3.5.1 Motives of Political Attacks

What brings political leakers to blow the whistle, thus initiating an investigation likely to hurt a MP? This section provides some descriptive evidence of the motives behind these political investigations. Because there is not enough information about political leakers to perform a statistical analysis aimed at inferring their underlying motives, we report examples of typologies that occur repeatedly in our data.

One possible driver of the political usage of RAPs is *ideology*. That is, it could be that the use of RAPs is increasing in the ideological distance between the leaker and the accused MP. While ideological disagreement is certainly a plausible motive for initiating an investigation, our data is based only on initiated RAPs, and therefore we cannot directly shed light on this mechanism. Yet in future work it might be possible to identify the ideological stakes of the accuser side to have a picture of whether political leakers are ideologically close or far from the accused MP. In particular, it would be interesting to see whether political leakers and accused MPs belong to different parties or to the same one. Furthermore, to the extent that factional struggle matters for initiating RAPs, we should expect more leakers belonging to the same party of the accused MP in the First Republic — when parties were highly factionalized and the electoral system incentivized

intra-party conflict (Chang, 2005) — than in the Second Republic.

Second, it could be that RAPs are an indication of *intra-party sabotage*. Competition among same-party factions was especially heavy in the Christian Democracy, where political corruption constituted a necessary evil to finance the exorbitant financial needs for the electoral campaign of opposing factions through illegal resources. Resorting to bribes was (and still is) extremely common in public procurement, which in our observations translates into several RAPs revealing a widespread financial network of kickbacks among firms and politicians. A well known — and representative — example of extortion and bribes directed to particular factions is the RAP initiated by Oscar Luigi Scalfaro (DC) against Vincenzo Scotti, another prominent member of an opposing faction within the DC.[29] The request reveals that — in the aftermath of an earthquake that hit Naples — the contractors tasked with the reconstruction of the infrastructures were forced to pay large sums of money to Scotti's faction in order to have their projects approved. This money was then used to finance the Neapolitan faction's expenses (and the electoral campaign above all). The MP denied all the accusations, and the case was widely covered by the media.[30]

Furthermore, RAPs could be used as campaigning tools by political opponents. This frequently happens with opinion RAPs, used among competitors in the same electoral district before elections. It is important to stress that, differently from corruption allegations, opinion RAPs are typically used defensively. One recurrent motive for politicians to initiate an opinion RAP is *defamation towards accusing opponents*. Political opponents frequently accuse each other of being close to the Mafia or being elected thanks to the

[29] More precisely, the information was gathered before the investigation by a special House committee (*Commissione Parlamentare di Inchiesta*) chaired by Scalfaro. Link to original RAP: http://legislature.camera.it/dati/leg11/lavori/stampati/pdf/37782.pdf.

[30] One of the main national newspapers, *La Repubblica*, closely followed the case pointing out the weakness of Scotti's defense to the prosecutors. Link to original article here: https://ricerca.repubblica.it/repubblica/archivio/repubblica/1993/04/22/scotti.

Mafia. To mention an example, on September 13, 1993 a request to proceed with the investigation of the deputy Giovanni Fava, elected in the district of Catania (Sicily), was presented on behalf of the Socialist MP Antonio Salvatore (PSI), elected in the same district. In the request, Fava is accused of publishing in the newspaper "Avvenimenti" (June 19, 1993) an article implying that the MP Salvatore interfered with the investigation of a major Mafia boss, Nitto Santapaola, interceding for him with the prosecutor.[31] These mafia-related incidents are frequent among opinion RAPs, as politicians often attempted to defend themselves from such accusations. Importantly, while mafia-related incidents are the object of defensive RAPs, the same are not used offensively with the aim of bringing down opponents. In fact, as already noted above, the prosecution of MPs investigated for participation to Mafia organizations is independent of authorization to proceed granted from the Chamber.

Finally, notice that, while political RAPs represent a minority of the observations in our sample, we conjecture that at least some "non-political" RAPs are initiated on behalf of politicians. That is, it is reasonable to believe that politicians want to engage in politics by other means without shouldering the costs of leaking the information themselves, hence provide known incriminating information to a third party (or anonymously to the prosecutors). In this sense, Andreotti's quote and personal experience are suggestive: despite having several political enemies, he was never involved in a RAP initiated *by another politician*.[32] Ultimately, it is not possible to empirically identify the political roots of non-political RAPs with existing data, and it might well be that the politicization of judicial investigation is even more pervasive than what our data shows.[33]

[31] Link to original RAP: http://legislature.camera.it/dati/leg11/lavori/stampati/pdf/38242.pdf.

[32] The RAP against Andreotti that gave rise to the "trial of the century" was based on the testimony of the Mafia informant (pentito) Tommaso Buscetta.

[33] We also believe that this observation is consistent with the main argument of the paper, which is that scandals could be politicized and that the relationship between the emergence of scandals and the underlying corruption is not necessarily monotone. Of course scandals could be even more politicized (i.e.,

3.5.2 Limitations and Future Directions

In this paper we seek to understand when investigations against MPs are initiated by other political actors. In order to do so, we base our dataset on all the RAPs sent by judicial prosecutors over the period 1983-2019, and link these requests to parties' electoral performance over the same period. This allows us to show that corruption RAPs are more likely to be initiated by political actors when the accused MP's party weakens electorally. That is, we show that conditional on parties losing vote shares there are more political leakers that explicitly accuse an MP through a RAP. An interesting related question that we do not consider is whether losing electoral support could trigger RAPs initiated by any actor (not only political ones). In other words, in addition to the relative number of political vs non-political RAPs, it could be that weaker parties receive more attacks in absolute terms. Future work could explore this question by augmenting our dataset to include all the MPs in a legislative term. This would allow to answer the question of whether weaker parties are more likely to receive any RAP, in addition to the relative number of political RAPs that we study.

A related important question concerns the determinants of parties losing vote shares. While we are agnostic about what determines parties' electoral decline, there are reasons to exclude that denunciations cause electoral insecurity. Typically voters are informed of MPs' corruption by media coverage of the judicial inquiry that is initiated by — and does not precede — RAPs. Without this knowledge, voters cannot internalize the information on corruption in their vote, as media are the major source of information for voters upon which effective accountability relies (Chang, Golden and Hill, 2010). Future work could compare the timing of media coverage of corruption allegations with respect to the corresponding RAP, to provide further evidence that RAPs constitute the first public an-

politicians could be behind other accusations as well), but we believe that our results provide a useful reference for a lower bound of the effect.

nouncement of the alleged misbehavior. Another reason to exclude reverse causality in our context is the old nature of corruption allegations, which for political RAPs are on average older than five years. In other words, it is unlikely that voters keep MPs accountable for corruption allegations that become known to the judiciary in a later electoral cycle.

Finally, are RAPs consequential, or likely to outbreak in scandals? Throughout the paper we present anecdotal evidence that they do, being covered by the press after requests are presented. Yet it could be interesting to systematically study the consequences of RAPs. A simple measure of RAPs' coverage suggests that this is indeed high. We searched for corruption-related keywords in La Repubblica, Italy's second most widely read daily newspaper. In the period 1983-2019, the keyword "Request of Authorization to Proceed" alone produced 1658 results. While we do not know the tone of the press, at least this provides information of RAPs' coverage. To provide further evidence, future research should analyze the aftermath of denunciations, by showing how often each RAPs leads to scandals, and with what consequences for the politician involved.

3.6 Conclusion

This paper studies political scandals through their denunciation, using original data on investigations of Italian MPs from 1983 to 2019. Results provide evidence in favor of a political use of investigations for corruption charges: when parties weaken, the likelihood of political denunciation of past misbehavior by political rivals increases.

The literature has shown that, when allegations of corruption are covered by the press, voters tend to punish politicians. While requests of authorization to proceed with the investigation of MPs represent a useful measure of the MPs' underlying corruption, our results suggest that sometimes these requests can be the results of politics "by other means"— i.e., politicians might find advantageous to publicly denounce their cronies' corruption for their political gains. Voters are most likely to make errors of inference

when the MPs' parties weaken, punishing alleged misbehavior that results from political opponents' attacks. This strategic use of investigations suggests to scale down the (partially) positive effect of accountability found by the literature, at least when incentives for political attacks are strong.

While we focus on Italian data for their richness, we believe that our findings are informative for other countries as well. The investigation of members of the legislature in most democracies is typically managed by the legislative institution itself. For example, the U.S. House of Representatives created the House of Ethics Committee in 1964 with the power to investigate and report evidence gathered to appropriate federal and state judicial authorities. Between 1972 and 2012, 5.1% of all representatives who served in the U.S. House of Representatives were subjected to a corruption investigation by the Ethics Committee, for a total of 93 investigations (Praino and Graycar, 2018). Our findings suggest that some of these investigations could be driven by political reasons.

While we do not systematically trace media coverage of each case of investigation, an overall search for these in news' archives suggests that they often results in scandals affecting the investigated MP. Recently, the former Minister of the Interior Matteo Salvini received a RAP for kidnapping that received massive coverage.[34] In the last years other investigations played a crucial role in everyday politics. For instance, Armando Siri, a junior minister belonging to Salvini's League, was forced to resign due to the pressure of the Five Star Movement (partner of the League in the Conte first cabinet) when Siri received a RAP concerning an investigation for money laundering. Similar examples can be found in other periods of Italian history, particularly (but not only) throughout the Tangentopoli scandal (when there was a daily media coverage of any investigation, even at early stages). In light of this, future research could further contribute to explaining the

[34] The RAP was related to the immigration crisis following Salvini's decision to shut ports to a migrant rescue ship.

link between political leakers, judicial investigation and media coverage to shed light on the role that judges and (sometimes partisan) journalists can have in damaging the image of a politician and its party.

Chapter 4: Does Electoral Volatility Beget Strong Alliances? A Theory of Multi-Party Competition

In multi-party systems, alternative future governments are often offered to voters by different configurations of pre-electoral alliances between political parties. A common way for different parties to form an alliance in a given election is to support joint candidates, while keeping their separate identities. For example, recent evidence from Mexican and Finnish local elections demonstrates that parties are willing to form pre-electoral alliances to remove entrenched incumbent parties from office (Frey, López-Moctezuma and Montero, 2021, Hortala-Vallve, Meriläinen and Tukiainen, 2021).

Alternatively, parties can join forces by merging into new political entities. Mergers are a common alternative to pre-electoral coalitions. In Europe, for example, mergers have occurred on average every third electoral period since World War II.[1] Furthermore, political leaders consider the option of merging even more frequently than what the number of occurrences suggests. For example, in the UK, mergers are an often discussed option, as indicated by frequent media reports about the advantages of a merger between the UK Liberal Democratic Party and the Labour Party.[2]

Mergers lead to significant changes in the party system. The Italian political landscape completely changed in 2007, when mergers across the ideological spectrum effectively

[1] Ibenskas (2016) collected a dataset that considers 280 democratic elections in the postwar period in European countries. Overall, the dataset includes 94 mergers formed by 216 parties. These mergers occurred over 59 electoral periods and were predominantly formed by two parties.

[2] Cf. Jenkins, S. (2019) 'The Lib Dems helped the Tories to victory again. Now they should disband', The Guardian, 16 December: https://www.theguardian.com/commentisfree/2019/dec/16/lib-dems-tories-split-vote-labour

transformed the system into bipolarism, with two main competing electoral cartels.[3] Stable pre-electoral alliances such as mergers facilitate the formation of durable parties and can reduce party system fragmentation. The fusion leading to the formation of the Christian Democratic Appeal in the Netherlands helped to eliminate the cleavage between Catholics and Protestants in the Dutch party system and substantially reduced party system fragmentation. Outside Europe, the merger between the Progressive-Conservative (PC) and the Canadian Alliance parties in 2003 created a new right-wing formation, significantly altering the Canadian party system and subsequent voting behavior (Bélanger and Godbout, 2010).

Despite the evidence showing that parties across the world are increasingly seen to join forces before election — adopting various governance configurations — pre-electoral alliances have not received much attention from the literature on electoral competition, which typically treats political parties as fixed entities. This paper proposes a model of elections in which parties can form pre-electoral alliances. Understanding the incentives behind different configurations of alliances is crucial, as these can have significant consequences on electoral outcomes, policy-making and the development of party systems.

What are the defining features that distinguish mergers from pre-electoral coalitions (hereafter, PECs)? The first dimension of variation is the *scope* of parties' cooperation (Ibenskas and Bolleyer, 2018). Golder (2006, 28) defines a PEC as a "collection of parties that do not compete independently in an election, either because they publicly agree to coordinate their campaigns, run joint candidates or joint lists, or enter government together following the election." Parties belonging to a coalition cooperate in specific areas

[3] The first fusion occurred between April and October 2007, when the *Democratici di Sinistra* — the largest of the successor parties of the former *Partito Comunista Italiano* — merged with *La Margherita* to form the Democratic Party (PD). A few months later, Berlusconi's *Forza Italia* merged with the right-wing *Alleanza Nazionale* to form the *Popolo della Libertà* in November. Triggered by the creation of the PD, a smaller merger occurred that same year between the parties of the radical left, which merged under the name of *Sinistra Arcobaleno*.

(e.g., electoral competition through the formation of joint lists of candidates), while still competing with their separate identities in other areas (e.g., member recruitment). In contrast, mergers are defined as "the amalgamation of two or more independent parties into a single party organization" (Ibenskas, 2016). This complete fusion implies that cooperation becomes unrestricted: a merger entails an agreement to become a new organization, which presupposes unrestricted and universal cooperation among the constituent parties.

The literature provides an intuitive analysis of the factors that should facilitate the formation of mergers. On the one hand, mergers are less likely to form among highly ideologically distant parties and when parties have established identities. On the other, a highly disproportional electoral system encourages parties to merge to improve their post-electoral legislative weight. However, very similar incentives drive parties' choice to join PECs, without relinquishing their own identity or party brand. When, and why, do parties retain their separate identities rather than merge into a larger party?

I argue that parties' choice over different forms of pre-electoral alliances crucially depends on *electoral volatility*, reflecting the extent to which voters' preferences change between subsequent elections. Electoral volatility can be thought as being inversely related to partisanship: if voters are highly partisan, voters' preferences are likely to stay constant over time. Parties face a dynamic trade-off: while mergers insure constituent parties against unfavorable shifts in the electorate's preferences, these binding forms of alliances come at the cost of losing the opportunity to join more advantageous coalitions in the future. Conversely, alliances that allow parties to maintain their identity offer more flexibility to respond to changes in voters' preferences.

To analyze this trade-off, the paper introduces a model of multi-party electoral competition where policy-motivated parties can form alliances before elections. In the model, each party is associated with a different policy platform, or "brand." While these brands are fixed, parties can change the policy platform that voters evaluate by joining pre-

electoral alliances. In particular, the platform resulting from an alliance is a convex combination of the constituent parties' platforms. Besides competing alone and forming PECs — whereby distinct parties run with a common platform — parties can constitute new political entities by merging. A merger is a binding arrangement that solidifies the relative power constituent parties have at a given point in time. Conversely, PECs preserve parties' identities, allowing parties to be more flexible to changes in the electoral environment.

The model features a two-period game between three parties. In each period, parties can form mergers or PECs (or run alone), and an election takes place. While mergers persist in the future election, PECs are only temporary alliances that need to be renegotiated in each period. This assumption reflects the empirical regularity that PECs are often revisited: for instance, coalition candidates' lists are typically renegotiated before each election. In contrast, once a merger is formed there is a high cost for terminating it. Indeed, mergers persist more easily across elections, as Figure 4.1 suggests.

When deciding which type of alliance to choose, if any, the main trade-off parties face is between the flexibility provided by a PEC and the insurance against large shifts in public opinion that a merger guarantees. Keeping separate identities allows parties to respond to changes in voters' preferences, which are modeled as a move of Nature in favor of either party that takes place between elections. By merging, parties commit to the relative power held at the time of the merger formation, which makes their electoral performance less subject to large shifts in voters' preferences.

The main result of the paper shows that when electoral volatility — i.e., the likelihood of large shifts in voters' preferences — is high enough, in equilibrium parties form strong alliances such as mergers. Intuitively, if voters' preferences shift too much in one direction, the advantaged party can govern alone; hence for high realizations of the shock the centrist party risks being left out of power. Conversely, as voters' preferences become

Number and Stability of Electoral Coalitions and Mergers per Country

Country	Average Number of Unstable Coalitions per Election	Average Number of Stable Coalitions per Election	Average Number of Unstable Mergers per Electoral Period	Average Number of Stable Mergers per Electoral Period
Bulgaria	1.5	0.7	0.2	0.3
Czech Republic	0.5	0.5	0.0	0.7
Estonia	1.0	0.8	0.3	1.3
Hungary	0.3	0.5	0.0	0.0
Latvia	0.7	1.5	0.2	1.0
Lithuania	1.0	0.2	0.3	1.2
Poland	1.8	0.5	0.2	0.8
Romania	1.0	0.3	0.0	1.2
Slovakia	0.7	1.0	0.0	1.0
Slovenia	0.2	0.0	0.2	0.7
Total	1.0	0.6	0.1	0.9

Figure 4.1: Number of stable/unstable coalitions and mergers in the first six electoral periods in 10 countries in Central and Eastern Europe. Source: Ibenskas and Bolleyer (2018).

more stable, the centrist party values more flexibility and prefers to wait to form a more advantageous coalition in the future. Electoral instability is often considered a characteristic of the early years of democratic regimes (Kitschelt et al., 1999). This result provides an explanation for the empirical observation that the frequency of mergers decreases as democratic regimes mature (Ibenskas and Sikk, 2017).

How does this central trade-off vary with different electoral, legislative, and executive institutions? The model formalizes how the incentives to form alliances depend on inter-party power sharing (Lijphart, 1984). The degree of power sharing depends on both the rules mapping votes into seats (e.g., electoral rule proportionality) and the rules governing legislative decisions (e.g., the presence of super-majority requirements). Results show that some degree of power concentration is a necessary condition for both PECs and mergers to take place. For example, disproportional electoral systems can induce parties to join forces by forming pre-electoral alliances to maximize their electoral chances (Olsen,

2007, Rakner, Svåsand and Khembo, 2007, Bélanger and Godbout, 2010). Conversely, pre-electoral alliances are not sustainable in consensual democracies that protect minority parties, which feature parties running alone in equilibrium.

While PECs allow parties to campaign autonomously, mergers demand that parties give up their ideological identities by forming new political entities that persist in the future. If voters are uncertain about the exact location of parties' platforms, different configurations of alliances among the same parties might be evaluated differently from the electorate. An extension of the model incorporates voters' uncertainty by introducing noise in the location of parties' platforms. To capture the fact that "mergers reduce, or even destroy, the information value of party labels for voters" (Ibenskas, 2016, 343), I assume that mergers are associated with higher noise than PECs, and the noise is increasing in the distance between the constituent parties' bliss points. The main results are robust to this setting when the noise associated with mergers is not too high. In contrast, mergers are not sustainable in equilibrium for high values of ideological uncertainty.

The paper provides novel insights and implications for the process of party system stabilization. The literature has often linked electoral volatility to unstable party systems. Indeed, several studies even use measures of electoral volatility as an indicator of party system instability.[4] However, by implicitly assuming that a volatile electorate is responsible for system instability, this approach overlooks the fundamental choices of elites in the determination of party system development (Tavits, 2008). This model suggests to take into account parties' strategic organizational choices to avoid omitted variable bias when evaluating the relation between electoral volatility and party system stability.

The remainder of the paper is organized as follows. Section 4.1 and 4.2 present the baseline model and main results. Section 4.3 and 4.4 extend the baseline model to consider alternative power sharing institutions and voters' uncertainty over parties' platforms.

[4] Cf. Tavits (2008) for an overview on Western European and OECD countries.

Section 4.5 discusses the results and concludes.

4.1 The Model

Consider a two-period game of electoral competition between three policy-motivated parties: $i = L, C, R$. Each period features a proposal stage, which determines parties' alliances, and an election. Each party is associated with a preferred policy platform $z_i \in \mathbb{R}$, where $z_l < z_c < z_r$. There exists a continuum of voters, indexed by v, who vote for one of the parties. Voters' ideal points are uniformly distributed over a subset of the policy space, $\mathcal{Z} \equiv [-a, a]$, where $\mathcal{Z} \subset \mathbb{R}$.[5] The ideal policy of voter v is denoted by $z_v \in \mathcal{Z}$.

The sequence of the proposal stage is as follows. First, the centrist party C proposes to either L or R to form a merger, or doesn't propose any merger. If C's proposal to L (R) is accepted, the merged party runs against R (L). If C's proposal is rejected, or if no merger is proposed, C proposes a PEC to either party, or doesn't propose any PEC. If C's proposal to L (R) is accepted, the PEC formed by L, C (C, R) runs against R (L). If C's proposal to L (R) is rejected or if no PEC is proposed, parties compete with their separate identities. After the proposal stage is completed, an election takes place, resulting in the adoption of the policy preferred by the winner.

Notice that the proposal stage rules out the possibility of an alliance between L and R. Besides being empirically rare, it is not clear which platform would emerge from an alliance between two non-moderate parties at the opposite extremes of the ideological spectrum, nor how to compute the resulting vote share. The sequence of the proposal is empirically motivated by the flexible nature of PECs vis-à-vis mergers: C can propose a PEC to either L, R *after* a merger proposal has been rejected, while it cannot propose a

[5] This assumption is without loss of generality and is merely convenient for computing parties' vote shares.

merger to L (R) after a merger proposal to R (L).[6] However, having C proposing a PEC to only one party or to both does not qualitatively change the results.

In what follows I formally define the policies that result from an alliance between party L and C. The policies resulting from an alliance between C and R are defined analogously. Denote by $V_{i,t}$ party i's vote share at time t, where $t = 1, 2$. Suppose that L and C merge or form a PEC in t. Then, the policy platform of the resulting party or PEC in t is a convex combination of the constituent parties' bliss points:

$$z^m_{lc,t} = z^{\text{pec}}_{lc,t} = \lambda_{l,t}\, z_l + (1 - \lambda_{l,t})\, z_c. \tag{4.1}$$

The weight $\lambda_{l,t} \in (0, 1)$ measures the relative electoral strength of the extreme party (L) in t, which depends on the parties' vote shares as follows:

$$\lambda_{l,t} = \frac{1}{2} + \phi(V_{l,t} - V_{c,t}), \tag{4.2}$$

where the parameter $\phi \in \mathbb{R}_+$ is small enough to ensure that $\lambda_{l,t} \in (0, 1)$. Equation 4.1 implies that the policies resulting from PECs and mergers are equivalent *in the same period*.[7]

At the beginning of the second period ($t = 2$), an exogenous shock ξ favoring party R affects all voters equally, where ξ is uniformly distributed in $[-\frac{1}{\psi}, \frac{1}{\psi}]$. The support of the shock represents electoral volatility: as ψ decreases, the support of the shock becomes larger, and electoral volatility increases. Conversely, as ψ increases, the support of the shock shrinks and the electoral outcome becomes more predictable.

After the shock is realized, if no merger formed in $t = 1$ the proposal and election stages of the second period take place. To simplify the description of the equilibrium,

[6] An alternative (less credible) bargaining protocol would allow C to make sequential merger proposals. However, this would not qualitatively affect the main results.

[7] The extension in Section 4.4 differentiates between the two types of alliances in the same period by introducing noise in the location of parties' platforms.

I assume that mergers persist in $t = 2$ after being formed in $t = 1$. That is, constituent parties cannot split in the period that follows the merger formation. This assumption is motivated by the bureaucratic costs and the change in the electorate's preferences that mergers might cause. Typically, several legal requirements are needed for the registration of a new party, which could impede the formation of a splinter party following a recent merger (Hug, 2001). Voters' preferences might also change because of the merger: previous supporters of the constituent parties might transfer their loyalties to the merged party. Furthermore, voters might consider the members of the splinter party as noncredible because of frequent changes in their party affiliation (Mershon and Shvetsova, 2013).

Because of electoral volatility, the policy resulting from a merger (or PEC) formed in $t = 2$ is different from the policy resulting from a merger formed in $t = 1$ and persisting in $t = 2$. This is because volatility changes parties' relative vote shares and in turn the weight each party has in the common platform. Crucially, while mergers "solidify" the relative power parties have in $t = 1$ — which is given by each party's vote share $V_{i,1}$ — PECs are re-negotiated in $t = 2$, allowing parties to be flexible to changes in the electoral environment which can alter their relative power.

Voters and parties have standard quadratic preferences over policies. Voter v's realized payoff from the implemented policy $\hat{x}_t$ is defined as $u_v(\hat{x}_t) = -\left(z_v - \hat{x}_t\right)^2$. Similarly, party i's payoff from $\hat{x}_t$ is $u_i(\hat{x}_t) = -\left(z_i - \hat{x}_t\right)^2$.

The implemented policy $\hat{x}_t$ is the preferred policy platform of the winner of the election, i.e., the party, PEC or merger with the majority of votes in t. If no party/merger/PEC obtains a majority, the implemented policy is determined post-electorally by the party chosen to be the *formateur* — i.e., the party that is awarded the opportunity to form a government. The baseline model assumes that the formateur is the one with the plurality of votes, and that this dominant party (or coalition) can implement its preferred policy after the election. Section 4.3 analyzes the case where the implemented policy is a compromise

among the policy positions of all the parties composing the parliament, without regard to whether these parties are in government or opposition.

The timing of the game is as follows:

1. The first period proposal and election stages take place, and the policy outcome is implemented.

2. Nature determines the realization of the shock to voters' preferences.

3. If a merger occurred in the first period, the second period election takes place. If no merger occurred in the first period, the second period proposal and election stages take place, and the policy outcome is implemented.

I focus on subgame perfect equilibria in pure strategies. For party C a pure strategy is a proposal decision in $t = 1$ and, conditional on no mergers forming in $t = 1$, a proposal decision in $t = 2$. For party L (R) a pure strategy is an acceptance decision in $t = 1$ and, conditional on no mergers forming in $t = 1$, an acceptance decision in $t = 2$. Since no voter is ever pivotal, I adopt the standard assumption that voters vote sincerely. Furthermore, I assume that voters maximize their current period payoff in each election. Parties, on the other hand, maximize their expected overall payoff, and each party evaluates the future according to a common discount factor $\delta \in (0, 1)$.

The following analysis assumes without loss of generality that C is weakly closer to L than to R: $|z_c - z_l| \leq |z_c - z_r|$. To avoid trivialities I also assume that in the first period i) no party has an outright majority and ii) parties' ideal points are such that C would obtain a majority by forming either alliance (with L or R).[8]

[8] Notice that these assumptions imply that parties' platform at least partially overlap with $\mathcal{Z}$ in the first period: i.e., $z_c \in \mathcal{Z}$, although z_l and z_r can lie outside of $\mathcal{Z}$.

4.2 Analysis

I start by computing the voters' decision in the second period, which determines the vote share of each party. Given these vote shares, I analyze parties' decision to form a merger or PEC or to run alone. Given the second period outcomes, I compute the expected payoff of each party from merging, forming a PEC or running alone in the first period as a function of electoral volatility, and characterize the equilibrium of the game.

4.2.1 Pre-Electoral Coalitions

Let us analyze first what happens in the second period *when no merger formed in the first period.* To compute party i's vote share from running alone ($V_{i,2}$) it suffices to identify the location of the voter who is indifferent between each pair of parties. Let $v_{lc,2}$ denote the ideal point of the voter who is indifferent between L and C in $t = 2$, where $v_{lc,2}$ is located at $(z_l + z_c)/2$. The voter who is indifferent between C and R, denoted by $v_{cr,2}$, is defined analogously. Then, the vote share of L is the CDF of the distribution of voters' ideal points evaluated at $v_{lc,2}$. Since voters' bliss points are uniformly distributed on $\mathcal{Z}$, L's vote share is simply:

$$V_{l,2} = \frac{2a + z_l + z_c - 2\xi}{4a}, \tag{4.3}$$

which depends on the realization of the shock to voters' preferences. A positive (negative) realization of the shock shifts voters' ideal policies to the right (left) thereby increasing the vote share of party R (L) by $|\xi|$. Similarly, $V_{c,2} = (z_r - z_l)/4a = V_{c,1}$ and

$$V_{r,2} = 1 - V_{l,2} - V_{c,2} = \frac{2a - z_c - z_r + 2\xi}{4a}. \tag{4.4}$$

The vote share of a PEC formed in the second period is derived analogously. Let $V_{lc,2}^{\text{pec}}$ be the vote share of a PEC between L and C in $t = 2$. Similarly to $V_{l,2}$ (4.3), the PEC's

vote share is computed by finding the location of the voter who is indifferent between $z^{\text{pec}}_{lc,2} = \lambda_{l,2}\, z_l + (1 - \lambda_{l,2})\, z_c$ and $z_{r,2}$, which produces

$$V^{\text{pec}}_{lc,2} = \frac{8a^2 + 2a(z_c + z_l + 2z_r - \phi z_c + \phi z_l - 4\xi) - \phi(z_c - z_l)(z_c - z_r + 2(z_l - \xi))}{16a^2}. \tag{4.5}$$

Similarly, the vote share of a PEC between C and R is

$$V^{\text{pec}}_{cr,2} = \frac{8a^2 - 2a(z_c + z_r + 2z_l - \phi z_c + \phi z_r - 4\xi) - \phi(z_c - z_r)(z_c - z_l + 2(z_r - \xi))}{16a^2}. \tag{4.6}$$

Finally, recall that $z^m_{lc,2} = z^{\text{pec}}_{lc,2}$ (4.1), which implies that the vote share of a merger formed in $t = 2$ is analogous to that of a PEC: i.e., $V^m_{lc,2} = V^{\text{pec}}_{lc,2}$ and $V^m_{cr,2} = V^{\text{pec}}_{cr,2}$.

Given these vote shares, what determines parties' choice in the second period? In the proposal stage, parties compare the realized payoff from merging, forming a PEC, and running alone. Because $z^m_{lc,2} = z^{\text{pec}}_{lc,2}$ and $z^m_{cr,2} = z^{\text{pec}}_{cr,2}$, parties are indifferent between merging and forming a PEC in $t = 2$. I assume that, when indifferent, party i chooses a PEC. It follows that party i compares the realized payoffs from the two possible PECs to that of running alone. These payoffs depend on the location of parties' ideal points, and on the realization of the shock to voters' preferences.

The shock has a twofold impact on parties' decision: first, it has a *direct* effect on parties' vote share, by swinging voters' preferences in favor of either L or R. I denote this the *electoral effect*. Second, by changing parties' relative vote share, the shock *indirectly* affects parties' influence on the final policy of a PEC. I denote this the *policy effect*.

In what follows I define threshold values of the shock realization that determine which of these two effects prevails in parties' decision to form a PEC in $t = 2$. These values also provide useful cutoffs to describe parties' equilibrium behavior in the second period.

Definition 4.1. *Let $\underline{\xi}(z_l, z_c, z_r)$ be the value of ξ such that L's vote share $V_{l,2} > 1/2$ for $\xi <$*

$\underline{\xi}(z_l, z_c, z_r)$. It follows from the expression of $V_{l,2}$ (4.3) that $\underline{\xi} = \frac{z_l+z_c}{2}$.

Similarly, let $\overline{\xi}(z_l, z_c, z_r)$ be the value of the shock realization such that R's vote share $V_{r,2} > 1/2$ for $\xi > \overline{\xi}(z_l, z_c, z_r)$. It follows from the expression of $V_{r,2}$ (4.4) that $\overline{\xi} = \frac{z_c+z_r}{2}$.

Let us first consider parties' decision when $\xi > \overline{\xi}$. When a party has the majority of votes, the electoral effect trumps every other consideration: by running alone, R can implement its preferred policy. Similarly, when $\xi < \underline{\xi}$ party L runs alone and wins, hence the implemented policy is $\hat{x}_2 = z_l$. Hence, for $\xi < \underline{\xi}$ ($\xi > \overline{\xi}$) L (R) rejects a PEC proposal from C and in equilibrium parties run alone in the second period.

When $\underline{\xi} < \xi < \overline{\xi}$, no party obtains an absolute majority *if all parties run alone*, yet a party that runs alone against a PEC could obtain a majority of votes. In particular, when parties form PECs, it could be that (i) $V^{\text{pec}}_{lc,2} > 1/2$, (ii) $V^{\text{pec}}_{cr,2} > 1/2$, or both. The following definition derives values of the shock realization that define each of these occurrences.

Definition 4.2. *Let $\underline{\xi}^{pec}(z_l, z_c, z_r)$ be the value of ξ such that $V^{pec}_{cr,2} > 1/2$ for $\xi > \underline{\xi}^{pec}(z_l, z_c, z_r)$. It follows from the expression of $V^{pec}_{cr,2}$ (4.6) that*

$$\underline{\xi}^{pec} = \frac{2a(z_c + (z_r - z_c)\phi + z_r + 2z_l) + \phi(z_c - z_r)(z_c + 2z_r - z_l)}{8a + 2\phi(z_c - z_r)}. \tag{4.7}$$

Similarly, let $\overline{\xi}^{pec}(z_l, z_c, z_r)$ be the value of ξ such that L's vote share $V^{pec}_{lc,2} > 1/2$ for $\xi < \overline{\xi}^{pec}(z_l, z_c, z_r)$. It follows from the expression of $V^{pec}_{lc,2}$ (4.5) that

$$\overline{\xi}^{pec} = \frac{2a(z_c + (z_l - z_c)\phi + z_l + 2z_r) - \phi(z_c - z_l)(z_c + 2z_l - z_r)}{8a + 2\phi(z_l - z_c)}. \tag{4.8}$$

Let us analyze C's decision when $\underline{\xi}^{\text{pec}} < \xi < \overline{\xi}^{\text{pec}}$. Definition 4.2 implies that for these values of the shock realization both PECs would reach an absolute majority. Then, C's proposal determines which PEC is formed in equilibrium. Under the assumptions, both L and R accept C's proposal — as running alone would result in a certain loss — and in

$t = 2$ a PEC is formed. Then, C's decision determines whether the PEC is between L and C or between C and R.[9] C compares the payoff from forming a PEC with L, i.e.,

$$u_c(z_{lc,2}^{\text{pec}}) = -\frac{(z_c - z_l)^2\left[\phi(z_c - z_r + 2(z_l - \xi)) + 2a(\phi + 1)\right]^2}{16a^2}, \tag{4.9}$$

with the payoff from forming a PEC with R

$$u_c(z_{cr,2}^{\text{pec}}) = -\frac{(z_c - z_r)^2\left[\phi(z_c - z_l + 2(z_r - \xi)) - 2a(\phi + 1)\right]^2}{16a^2}. \tag{4.10}$$

The following results show how C's decision changes with different values of the shock realization and with the location of parties' platforms. In particular, Lemma 4.1 shows that, as voters' preferences shift in favor of R (L), the centrist party prefers a coalition with L (R). Lemma 4.2 then shows that C prefers an alliance with the ideologically closest party when voters' preferences are stable (i.e., $\xi = 0$). Finally, Proposition 4.1 characterizes the (second period) equilibrium alliance configuration based on the value of the shock realization.

Lemma 4.1. Policy Effect. *Let* $\Delta_c^{pec}(\xi) = u_c(z_{lc,2}^{pec}) - u_c(z_{cr,2}^{pec})$. $\Delta_c^{pec}(\xi)$ *is strictly increasing in* ξ.

Proof. All proofs can be found in the Appendix. □

When $\underline{\xi}^{\text{pec}} < \xi < \overline{\xi}^{\text{pec}}$ both PECs obtain a majority if formed. When this is the case, Lemma 4.1 shows that the policy effect determines C's proposal decision. To see why, suppose that the shock realization is such that C is indifferent between the two coalitions. Now, let the value of the shock realization increase. This increase leads to a higher (lower) vote share of party R (L), which means that R (L)'s preferred policy weighs more (less) in

[9] Running alone is strictly dominated for C, because it would result in the adoption of the policy preferred by the party with the plurality of votes.

a PEC between C and R (L). Then, ceteris paribus, C would prefer to form a PEC with L. Conversely, a lower value of the shock makes a coalition with R more appealing.

Whether C forms a PEC with L or R ultimately depends on the location of the platforms z_i. Let us first evaluate what PEC party C prefers when $\xi = 0$, i.e., when voters' preferences are stable. In this case, C is indifferent between L and R (i.e., $\Delta_c^{\text{pec}}(0) = 0$) when z_l and z_r are equidistant from z_c, and prefers the closer ally otherwise, as the next result shows.

Lemma 4.2. *$\Delta_c^{pec}(0)$ is strictly increasing in z_r.*

Since C is closer to L than to R by assumption, a corollary of Lemma 4.2 is that when $\xi = 0$ party C prefers a coalition with L. Furthermore, Lemma 4.1 implies that when the shock favors R (i.e., when $\xi > 0$), C continues to prefer an alliance with L.

The next definition derives the value of the shock realization, $\hat{\xi}$, such that party C is indifferent between proposing a PEC to L or R (i.e., $\Delta_c^{\text{pec}}(\hat{\xi}) = 0$) for any z_i.

Definition 4.3. *Let $\hat{\xi}(z_l, z_c, z_r)$ be the value of the shock realization such that $\Delta_c^{pec}(\hat{\xi}) = 0$. It follows from the expression of Δ_c^{pec} (4.9-4.10) that*

$$\hat{\xi} = \frac{a(\phi + 1)(2z_c - z_l - z_r)}{\phi(z_l - z_r)} - z_c + z_l + z_r. \tag{4.11}$$

It follows from Lemma 4.1 that C prefers to form a PEC with L (R) when $\xi > \hat{\xi}$ ($\xi < \hat{\xi}$). Whenever both PECs obtain the majority of votes ($\underline{\xi}^{\text{pec}} < \xi < \overline{\xi}^{\text{pec}}$), the threshold $\hat{\xi}$ determines which of the two PECs form.

Figure 4.2 summarizes the implications of Lemma 4.1 and Lemma 4.2, plotting the region such that $\Delta_c^{\text{pec}}(\xi) > 0$ as a function of ξ (x axis) and z_r (y axis). Party L and C's preferred platforms are set respectively to $z_l = -0.6$ and $z_c = 0$.

When the electoral shock favors R ($\xi > 0$, right region), party C prefers to form a PEC with L, unless R is ideologically close enough. When the shock realization favors L ($\xi < 0$,

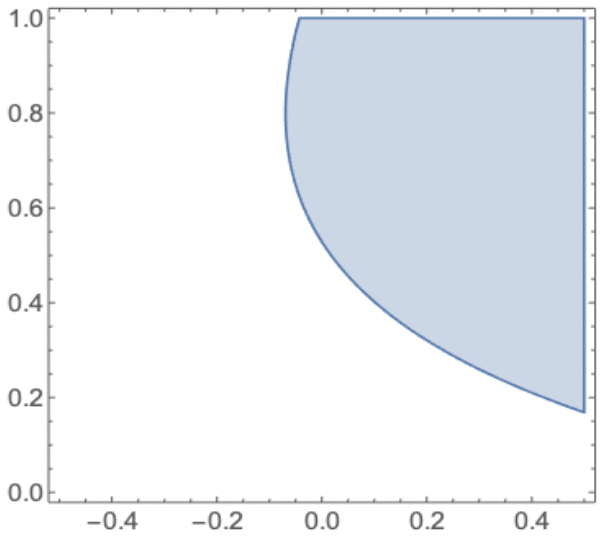

Figure 4.2: **PEC decision.** $\Delta_c^{\text{pec}}(\xi)$ as a function of the value of ξ (x axis) and z_r (y axis). The blue region corresponds to the values of ξ, z_r such that C prefers a coalition with L than with R ($\Delta_c^{\text{pec}} > 0$). The other parameters are set to $z_l = -0.6$, $z_c = 0$, $a = 1$ and $\phi = 1.5$.

left region), party C prefers to form a PEC with R. This happens because the policy cost effect from a PEC with L induces the centrist party to form a coalition with R (Lemma 4.1). This policy effect prevails whenever C could achieve a majority by forming a PEC with both parties (i.e., when $\underline{\xi}^{\text{pec}} < \xi < \overline{\xi}^{\text{pec}}$). Fix $z_r = 0.7$. For these parameter values, we have that $\underline{\xi}^{\text{pec}} = -0.17$, $\overline{\xi}^{\text{pec}} = 0.24$, and that $\hat{\xi} = -0.03$. Hence, in equilibrium a PEC between C and R (C and L) forms for $\underline{\xi}^{\text{pec}} < \xi < \hat{\xi}$ ($\hat{\xi} < \xi < \overline{\xi}^{\text{pec}}$).

Finally, it could be that only one PEC has the absolute majority of votes in the second period. Suppose that $V_{lc,2}^{\text{pec}} > 1/2$ and $V_{cr,2}^{\text{pec}} < 1/2$.[10] If C were to propose a PEC to L, L would reject because it could set its preferred platform by forming a minority government after elections.[11] Similarly, because L has a relative majority, a PEC between C and R would not change the post-electoral policy set by L. Hence, when only a PEC between L and C reaches the absolute majority of votes, in equilibrium parties run alone and L

[10] It follows from Definition 4.2 that this is the case for $\underline{\xi} < \xi < \underline{\xi}^{\text{pec}}$.

[11] Notice that this would not be true if the realized policy was determined after parliamentary negotiations among all parties. Section 4.3 analyzes this possibility.

forms a minority government (the case such that $V_{cr,2}^{\text{pec}} > 1/2$ is analogous).

The following proposition summarizes the last observation and the previous results without proof.

Proposition 4.1. PEC Decision and Second-Period Policy Outcome. *Suppose that no merger formed in $t = 1$. Then, in $t = 2$ parties form PECs for intermediate realizations of the shock ξ, and compete alone for extreme ones. In particular, for $\underline{\xi}^{pec} < \xi < \hat{\xi}$ ($\hat{\xi} < \xi < \overline{\xi}^{pec}$), a PEC between C, R (C, L) forms, and $\hat{x}_2 = z_{cr,2}^{pec}$ ($z_{lc,2}^{pec}$). Conversely, when $\xi < \underline{\xi}^{pec}$ ($\xi > \overline{\xi}^{pec}$), parties run alone and $\hat{x}_2 = z_l$ (z_r).*

The second-period analysis summarized in Proposition 4.1 suggests when we should expect parties to run alone or to form alliances. One interesting insight that emerges from the analysis is that parties can join PECs to prevent other parties from obtaining an absolute majority and control of the policy-making process. In line with this logic, Hortala-Vallve, Meriläinen and Tukiainen (2021) provide evidence from Finnish municipalities that parties join PECs to avoid concentration of power in the hands of the largest party when this is close to obtaining more than half of the seats. Similarly, Frey, López-Moctezuma and Montero (2021) document that in Mexican mayoral elections parties form alliances to remove advantaged incumbent parties from office. Furthermore, taking the electoral effect as given, Lemma 4.2 suggests that we should expect PECs to be more likely among ideologically close parties, a result which is widely supported by the empirical literature on pre-electoral coalitions (Golder, 2006, Ibenskas, 2016, Hortala-Vallve, Meriläinen and Tukiainen, 2021).

Let $U_{i,2}(\neg m_1)$ denote the expected second-period payoff of party i, *when no merger formed in the first period*. Proposition 4.1 allows us to express $U_{i,2}(\neg m_1)$ as a function of electoral volatility. By the uniform assumption of the shock, the probability of ξ falling below some threshold x is $\Pr\{\xi < x\} = \frac{1}{2} + \frac{\psi}{2}(x)$, hence the expected payoff from the second

period is simply:

$$U_{i,2}(\neg\, m_1) = \left[\frac{1}{2} + \frac{\psi}{2}\left(\underline{\xi}^{\text{pec}}\right)\right] u_i(z_l) + \left[\frac{\psi}{2}(\hat{\xi}) - \frac{\psi}{2}\left(\underline{\xi}^{\text{pec}}\right)\right] V_{i,2}(z^{\text{pec}}_{cr,2}) + \left[\frac{\psi}{2}\left(\overline{\xi}^{\text{pec}}\right) - \frac{\psi}{2}\left(\hat{\xi}\right)\right] V_{i,2}(z^{\text{pec}}_{lc,2}) + \left[\frac{1}{2} - \frac{\psi}{2}(\overline{\xi}^{\text{pec}})\right] u_i(z_r), \tag{4.12}$$

where $V_{i,2}(z^{\text{pec}}_{lc,2})$ is the expected payoff of party i from the LC coalition platform, which depends on the realization of the shock:

$$V_{i,2}(z^{\text{pec}}_{lc,2}) = \int_{-1/\psi}^{1/\psi} u_i\left(z^{\text{pec}}_{lc,2}\right)\frac{\psi}{2} d\xi. \tag{4.13}$$

These expressions will determine the equilibrium in the first period, when parties compare $U_{i,2}(\neg m_1)$ to the expected second-period payoff conditional on a merger in $t = 1$, which is derived next.

4.2.2 Mergers

The second-period analysis following a merger in $t = 1$ is more straightforward. Suppose that a merger between L and C formed. Let $\tilde{\xi}_l$ be the value of the shock realization such that a merger between L and C obtains half of the vote share, where $\tilde{\xi}_l = (z^m_{lc} + z_r)/2$. Then, for $\xi < \tilde{\xi}_l$, the policy outcome is $\hat{x}_2 = z^m_{lc}$, otherwise it is $\hat{x}_2 = z_r$. Similarly, suppose that a merger between C and R formed in $t = 1$. Let $\tilde{\xi}_r$ be the value of the shock realization such that a merger between C and R obtains half of the vote share, where $\tilde{\xi}_r = (z_l + z^m_{cr})/2$. For $\xi > \tilde{\xi}_r$, the policy outcome is $\hat{x}_2 = z^m_{cr}$, otherwise it is $\hat{x}_2 = z_l$.

Denote by $U_{i,2}(m_{lc,1})$ the expected second-period payoff of party i, *when a merger between L and C formed in the first period*. This is simply

$$U_{i,2}(m_{lc,1}) = \left[\frac{1}{2} + \frac{\psi}{4}\left(z^m_{lc,1} + z_r\right)\right] u_i(z^m_{lc,1}) + \left[\frac{1}{2} - \frac{\psi}{4}\left(z^m_{lc,1} + z_r\right)\right] u_i(z_r). \tag{4.14}$$

Similarly, the expected payoff of party i from a merger between C and R can be written as

$$U_{i,2}(m_{cr,1}) = \left[\frac{1}{2} - \frac{\psi}{4}\left(z_l + z^m_{cr,1}\right)\right] u_i(z^m_{cr,1}) + \left[\frac{1}{2} + \frac{\psi}{4}\left(z_l + z^m_{cr,1}\right)\right] u_i(z_l). \tag{4.15}$$

Given these expressions, we can easily compare party C's expected payoff from merging with L and R. The expected payoff of party i from a merger between L and C is the sum of two components: the realized payoff from the merged party policy platform in $t = 1$ and the expected payoff from the winning policy in $t = 2$ following a merger (4.14), i.e.,

$$U^m_{i,lc} = u_i(z^m_{lc,1}) + \delta U_{i,2}(m_{lc}), \tag{4.16}$$

where the realized policy in the first period coincides with the merged party's platform, since the merger has the majority of votes in $t = 1$. The expression for $U^m_{i,cr}$ is analogous.

When does C prefer to merge with the closest party L? The payoff that C obtains in the first period from merging with L is clearly higher than the one following a merger with R, because the implemented policy resulting from the former is closer to C's ideal point. Yet, depending on the probability of winning the election in the second period, C might prefer to merge with R. The next result shows that as volatility increases C prefers to merge with the ideologically more distant party (R), which benefits more from a volatile electorate than L.

Lemma 4.3. *Let $\Delta^m_c(\psi) = U_{i,2}(m_{lc,1}) - U_{i,2}(m_{cr,1})$. $\Delta^m_c(\psi)$ is strictly increasing in ψ.*

Similarly to the second period analysis over PECs, whether C prefers to merge with L or R depends on the location of the platforms. Intuitively, as R moves away from C's preferred platform, C is more likely to form a merge with L, as shown in the next result.

Lemma 4.4. *$\Delta^m_c(\psi)$ is strictly increasing in z_r.*

It follows from Lemma 4.3 and Lemma 4.4 that, depending on the value of electoral

volatility, C might prefer to merge with either L or R. Let $\tilde{\psi}(z_l, z_c, z_r)$ be the value of the shock realization such that $\Delta_c^m(\tilde{\psi}) = 0$, that is, such that party C is indifferent between proposing a merger to L or R in the first period for any z_i.[12] Then, C prefers to form a merger with R (L) when $\psi < \tilde{\psi}$ ($\psi > \tilde{\psi}$).

Figure 4.3 summarizes these observations, plotting the region such that $\Delta_c^m(\psi) > 0$ as a function of ψ (x axis) and z_r (y axis). Party L and C's preferred platforms are set to $z_l = -0.6$ and $z_c = 0$ respectively. Intuitively, when z_r is closer to C than L ($z_r < 0.6$), C prefers to merge with R. As R becomes more extreme than L, which merger is preferred from C depends on electoral uncertainty: as the support of the shock grows, C can prefer a merger with R (upper left region), even if the latter is further away from C. In other words, by affecting the future expected vote share electoral volatility can mute policy considerations when comparing mergers with different parties in the first period.

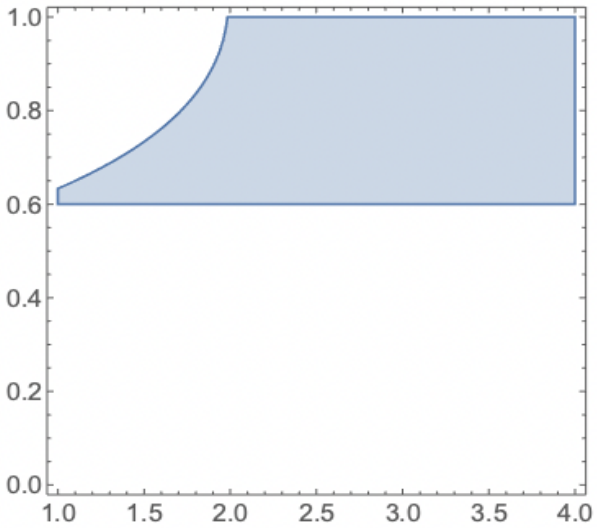

Figure 4.3: **Merger decision.** $\Delta_c^m(\psi)$ as a function of the value of ψ (x axis) and z_r (y axis). The blue region corresponds to the values of ψ, z_r such that C prefers to merge with L rather than with R ($\Delta_c^m > 0$). The other parameters are set to $z_l = -0.6$, $z_c = 0$, $a = 1$ and $\phi = 1.5$.

[12] The expression for $\tilde{\psi}(z_l, z_c, z_r)$ is presented in the Appendix.

4.2.3 When are Mergers Sustainable? The Role of Electoral Volatility

It is now possible to describe the equilibrium of the game. The next result shows that there exists a trade-off between merging and forming a PEC depending on electoral volatility.

The previous section has derived the expected payoff of party i from a merger between L and C (4.16). This is compared to the expected payoff of party i from a coalition between L and C, i.e.:

$$U_{i,lc}^{\text{pec}} = u(z_{lc,1}^{\text{pec}}) + \delta U_{i,2}(\neg m_1), \tag{4.17}$$

where the second component of the RHS is party i's expected payoff in $t = 2$ following a PEC between L and C (4.12). The expressions for $U_{i,cr}^{\text{pec}}$ is analogous, where the first-period realized payoff is $u_i(z_{cr}^{\text{pec}})$, and the second period expected payoff is $U_{i,2}(\neg m_1)$.

What conditions can sustain an equilibrium in which parties merge? For C to prefer a merger with L, it must be that (i) $U_{c,lc}^{m} > U_{c,cr}^{m}$, (ii) $U_{c,lc}^{m} > U_{c,cr}^{\text{pec}}$, (iii) $U_{c,lc}^{m} > U_{c,cr}^{\text{pec}}$ and (iv) $U_{c,lc}^{m} > U_{c}^{\text{alone}}$.[13] Notice that we know from Lemma 4.3 that for high electoral volatility C prefers to merge with the more extreme party R. Furthermore, we can immediately compare the expected payoff from the two PECs, because the second period payoff is the same for both of them (4.12). This leads to the following strict ranking for party C: $U_{c,lc}^{\text{pec}} > U_{c,cr}^{\text{pec}}$, which simply follows from comparing the first-period payoffs.[14]

The next result describes the equilibrium of the baseline game, showing that different alliance configurations can emerge depending on the electorate's volatility.

Proposition 4.2. Electoral Volatility and Merger Equilibrium. *Let $\hat{\psi}$ be the value of ψ such that C is indifferent between merging and forming a PEC with the closest party (L). In the first period, when electoral volatility is sufficiently low ($\psi > \hat{\psi}$), C forms a PEC with the closest party*

[13] Clearly, conditions (i)-(iv) are necessary but not sufficient for a merger between C and L to form in equilibrium, as the merger must be incentive compatible for L as well.

[14] It is straightforward to derive similar rankings for L and R respectively: $U_{l,lc}^{\text{pec}} > U_{l,cr}^{\text{pec}}$ and $U_{r,cr}^{\text{pec}} > U_{r,lc}^{\text{pec}}$.

(L). Mergers emerge for high electoral volatility: when $\tilde{\psi} < \psi < \hat{\psi}$, C merges with the closest party (L), and when $\psi < \tilde{\psi}$, C merges with the more extreme party (R).

Proposition 4.2 conveys a simple intuition about parties' incentives to join different types of alliances. When the likelihood of large shifts in voters' preferences is high enough, in equilibrium the centrist party prefers to merge rather than to form a PEC. By merging, the centrist party insures itself against large shifts in the electorate's preferences, at the cost of losing the opportunity to form a more advantageous coalition in the future. Furthermore, when $\tilde{\psi} < \psi < \hat{\psi}$, C chooses the ideologically closest party to minimize the policy cost from the merged party platform. This result is consistent with empirical evidence on the ideological location of constituent parties joining mergers (Ibenskas, 2016). However, when volatility is extremely high ($\psi < \tilde{\psi}$), electoral considerations might trump the policy effect, resulting in a merger with more distant allies.

Proposition 4.2 also shows that mergers are not sustainable anymore when voters' preferences are stable — which can be empirically associated with a highly partisan electorate. In this case, the centrist party values more flexibility, and forms with the closest party a temporary alliance which does not bind its policy platform in the future. By forming a PEC in the first period, the centrist party maintains its original platform, preserving its brand for the future election, when more information about voters' preferences is available.

Proposition 4.2 suggests that we should expect mergers to be empirically associated with volatile electorates. In principle, an accurate measure of electoral volatility should reflect the extent to which personal votes change between subsequent elections. Thus, individual level data identifying voters' intentions to vote or party identification across time represent an accurate measure of volatility.

In the absence of individual level data, empirical analysts have turned to aggregate measures of volatility (Pedersen, 1979, Bartolini and Mair, 1990, Sikk, 2005, Emanuele,

2015). The original index of volatility, developed by Pedersen (1979), measures the sum of the absolute values of vote percentage changes of parties from one election to another divided by two. This measure presents endogeneity concerns, as mergers alter the configuration of the party system thus generating volatility. One solution, as suggested by Sikk (2005), is to consider the merged parties as one in the election where they ran separately. This approach is preferred because it does not lead to overestimation of volatility scores. It is a conservative approach because it assumes that the constituent parties' voters should also support the merged party, thus underestimating voter mobility.

4.2.4 Illustration: Equilibrium Alliances and Volatility

Proposition 4.2 shows that a merger between C and L is only sustainable in equilibrium when $U^m_{c,cr} > U^{\text{pec}}_{c,lc}$, as in this case a merger is incentive compatible for L. Conversely, when $U^m_{c,cr} < U^{\text{pec}}_{c,lc}$, L could reject a merger proposal and the outcome would be a PEC with C, L's preferred option. The following example illustrates this point, by deriving the equilibrium for fixed parties' preferred platforms and showing each party's incentives to form alliances given different values of electoral uncertainty.

Considers parties' platforms such that the centrist party lies in the middle of the policy space $\mathcal{Z} = [-1, 1]$, and the right party is more extreme than the left. Let $z_l = -0.6$, $z_c = 0$ and $z_r = 0.7$, such that no party has a majority in $t = 1$: $V_{l,1} = 0.35$, $V_{c,1} = 0.325$, $V_{r,1} = 0.325$.

Let's start by computing parties' decision in the second period. For high values of the shock realization ($\xi > \overline{\xi}$) R runs alone and the implemented policy is $\hat{x}_2 = z_r$. Similarly, for low values of the shock realization ($\xi < \underline{\xi}$) L runs alone and $\hat{x}_2 = z_l$. For intermediate values of the shock realization ($\underline{\xi}^{\text{pec}} < \xi < \overline{\xi}^{\text{pec}}$), $V^{\text{pec}}_{lc,2} > 1/2$ and $V^{\text{pec}}_{cr,2} > 1/2$. In this case, both L and R are willing to form an alliance with C, and in $t = 2$ a PEC is formed.

To decide which PEC to form, C compares the payoff from a PEC with L (4.9) to that of a PEC with R (4.10). Whether one alliance is preferred to the other depends on the value

of the shock realization. Recall that $\Delta_c^{\text{pec}}(\xi) = u_c\left(z_{lc,2}^{\text{pec}}\right) - u_c\left(z_{cr,2}^{\text{pec}}\right)$. Figure 4.4 provides a graphical representation of C's decision, plotting the region for which $\Delta_c^{\text{pec}}(\xi) > 0$ as a function of the shock realization (x axis) and z_c (y axis), for $z_l = -0.6$ and $z_r = 0.7$. As the shock favors R, C's incentives to form a coalition with L increase because of the policy effect of an increased weight in the PEC platform.

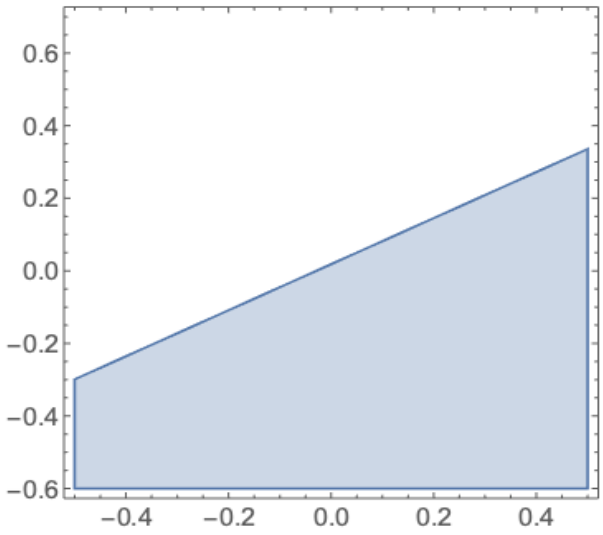

Figure 4.4: $\Delta_c^{\text{pec}}(\xi)$ as a function of the value of ξ (x axis) and z_c (y axis). The blue region corresponds to the values of ξ, z_c such that C prefers a coalition with L than with R ($\Delta_c^{\text{pec}} > 0$). The other parameters are set to $z_l = -0.6$, $z_r = 0.7$, $a = 1$, $\psi = 2$ and $\phi = 1$.

For these parameter values, the following is the equilibrium second-period outcome as a function of the shock realization: when $\xi < \underline{\xi} = -0.17$, parties run alone and $\hat{x}_2 = z_l$, when $\underline{\xi} < \xi < \hat{\xi}$ (where $\hat{\xi} = -0.03$) a PEC among C and R forms and $x_2 = z_{cr,2}^{\text{pec}}$, when $\hat{\xi} < \xi < \overline{\xi}$ (where $\overline{\xi} = 0.24$) a PEC among C and L forms and $\hat{x}_2 = z_{lc,2}^{\text{pec}}$, and when $\xi > \overline{\xi}$, parties run alone and $\hat{x}_2 = z_r$.

In the first period parties compare the expected values of merging, forming PECs and running alone as a function of electoral volatility. Figure 4.5 illustrates which types of alliances emerge in equilibrium as a function of electoral volatility. The orange and gray regions plot the range of parameters sustaining an equilibrium where parties merge in

the first period, while the blue region plots the range for which parties form PECs in the first period, as a function of ψ (x axis) and parties' discount factor (y axis).

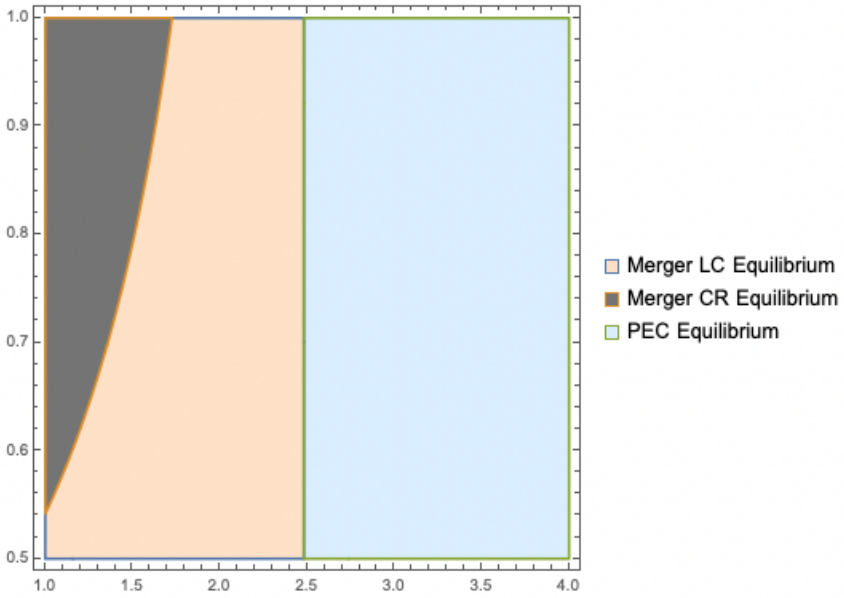

Figure 4.5: Equilibrium featuring mergers (orange region) and PECs (blue region) as a function of ψ (x axis) and parties' discount factor δ (y axis). Parties' bliss points are set to $z_l = -0.6$, $z_c = 0$, $z_r = 0.7$. Voters bliss points are uniformly distributed in $[-1, 1]$.

Which type of alliance between C and L is sustainable in equilibrium, for these parameter values? To answer, we need to verify that a merger (or PEC) is incentive compatible for L for some of the values of volatility for which C wants to merge (or form a PEC) with L. For the parameter values in this example, L always prefers a PEC to a merger with C. Hence, when volatility is low (ψ high enough), C proposes a PEC to L, which accepts, and a PEC forms in equilibrium (blue region).

As electoral volatility increases (ψ decreases), the centrist party's incentives to merge increase. Suppose that C proposes a merger to L for $\tilde{\psi} < \psi < \hat{\psi}$, i.e., for the values of volatility such that C prefers a merger with L to both a merger with R and to a PEC with L. If L accepts, its expected payoff is $U^m_{l,lc}$. If L rejects, the outcome depends on C's ranking of alternatives, which varies with ψ. That is, if $U^m_{c,lc} > U^{\text{pec}}_{c,lc} > U^m_{c,cr}$, knowing C's ranking L

rejects the proposal, and in equilibrium a PEC between C and L (i.e., L's preferred option) forms. If instead $U^m_{c,lc} > U^m_{c,cr} > U^{\text{pec}}_{c,lc}$, L knows that a merger between R and C (its least preferred option) would form following a rejection. In the latter case, L accepts C's offer and a merger between C and L forms.

Finally, when electoral volatility is very high $\psi < \tilde{\psi}$, we know from Lemma 4.3 that party C prefers to merge with the extreme party R. We also know from Proposition4.2 that party R always accepts a merger proposal, thus a merger between C and R forms when $\psi < \tilde{\psi}$.[15]

To summarize, when electoral volatility is low enough (i.e., for ψ high enough, blue region), C's best option is to form a PEC with L in $t = 1$, as this choice ensures the flexibility to form the best alliance in $t = 2$. Yet, as electoral volatility increases (i.e., as ψ decreases), the expected cost of being left out from a coalition becomes more important, and C prefers to form a merger with the closest party to insure itself against such an outcome (orange region). Finally, when electoral volatility is extremely high, in equilibrium a merger between C and the more extreme R could emerge (gray region).

4.2.5 Party Ideological Polarization

How does an increase in ideological polarization affect the equilibrium of the game? Generally, the term ideological polarization might refer to two related, yet distinct, concepts. The first concept concerns the policy positions of different parties. This is the meaning adopted by American politics scholars such as McCarty, Poole and Rosenthal (2016), and by recent Comparative politics literature (Dalton, 2008, Indridason, 2011). The second concept relates to voters' polarization. In what follows I focus on the first concept of

[15] Notice that the boundary between the two merger equilibria regions is not exactly vertical. This happens because a lower discount factor mutes the extent to which less electoral volatility results in a merger equilibrium with the extreme party.

party polarization and see how this impacts the equilibrium party system.[16]

Defining party polarization in multi-party systems is not straightforward, because a good measure requires to take into account both the ideological position of parties as well as their vote share. Intuitively, a highly polarized system is one in which big parties (or coalitions of parties) are located at the opposite extremes of the policy spectrum. The empirical literature on coalition formation has typically operationalized polarization with "ideological division," which represents the greatest ideological distance between any two parties (within the coalition and the opposition). However, as Indridason (2011) notes, this measure does not satisfy some properties expected in a definition of polarization, such as responsiveness to moderate parties' movements.[17]

For the purpose of this model, I will consider the following working definition: polarization increases if the distance of any party from the policy space center increases.[18] The question then is how an increase in polarization, or parties' ideological extremism, affects the sustainability of different alliances in equilibrium.

The next result assumes that the centrist party lies in the middle of the policy space and studies movements in the location of the right party. An increase in ideological extremism amounts to an increase in z_r, keeping z_l fixed.

Remark 4.1. Ideological Extremism. *Let* $z_c = 0$. *Then*,

$$\frac{\partial \left[\partial (U^m_{c,lc} - U^{pec}_{c,lc}) / \partial \psi \right]}{\partial z_r} < 0. \tag{4.18}$$

[16] While I do not analyze here the concept of voter polarization, it would be interesting to study how different distributions of voters' preferences (e.g., a more extreme electorate) change the supply of parties.

[17] For example, suppose that, all else equal, the central party moves to the right. In this case, polarization should increase because the right becomes more cohesive and the gap between the left and the right increases. Similarly, suppose that the left and the right parties are equidistant from the center party, and that their vote share increases without changing their platforms' location. In this case as well polarization should increase. Yet, the ideological division measure remains constant in both examples.

[18] A limitation of this definition is that by changing the location of parties' platforms, the relative vote share of parties changes as well, because in the model voters are uniformly distributed over $\mathcal{Z}$.

From Proposition 4.2, we know that $\partial(U^m_{c,lc} - U^{\text{pec}}_{c,lc})/\partial\psi < 0$. That is, C's incentives to merge with L increase with electoral volatility. Remark 4.1 shows that the magnitude of this incentive varies with R's extremism: the negative cross-partial implies that an increase in volatility expands the region of the parameter space supporting a merger equilibrium more when R is closer to the policy space. Conversely, as z_r moves away from the center, the advantage of merging vis-à-vis forming a PEC shrinks.

Figure 4.6 provides an illustration of this result, showing how the equilibrium regions vary as a function of R's ideological extremism (y axis) and ψ (x axis), for $z_c = 0$ and $z_l = -0.6$. When electoral volatility is low enough (ψ is high), C is always better off forming a PEC regardless of the location of z_l (the more extreme party). As ψ decreases, the region such that a merger emerges in equilibrium (orange region) expands. In particular, as z_r becomes more extreme, the merger region becomes less elastic to changes in electoral volatility.

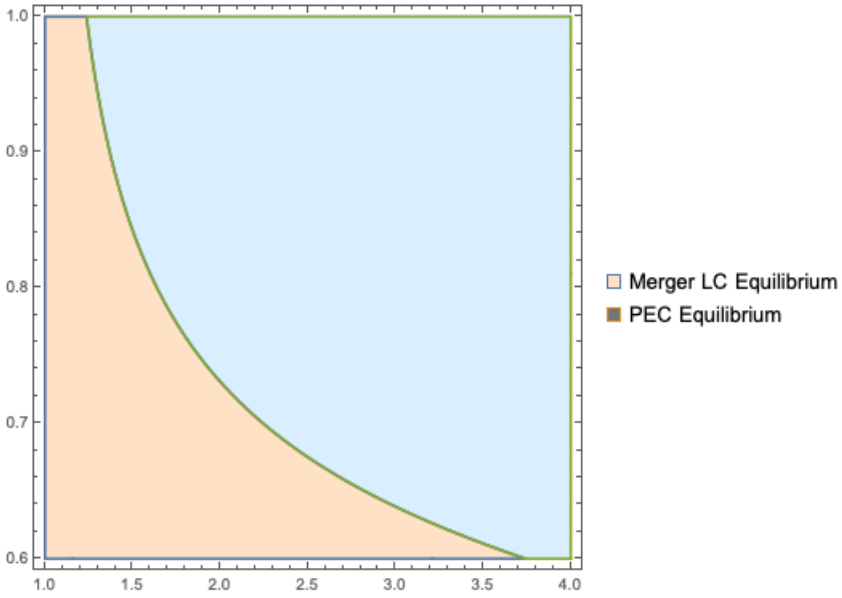

Figure 4.6: Equilibrium featuring mergers (orange region) and PECs (blue region) as a function of ψ (x axis) and z_l (y axis). The other parameters are set to $z_c = 0$, $z_l = -0.6$, $\delta = 0.8$, $a = 1$ and $\phi = 1/2$.

4.3 Alternative Power Sharing Arrangements

How do different configurations of inter-party power sharing affect parties' decision to organize into different types of alliances? The baseline model assumes that the implemented policy coincides with the preferred platform of the party (or coalition) that wins the election: i.e., the party with the majority of votes entirely controls the policy-making process. I refer to this as the *centralized-power model*. However, we might think of policies as a compromise among the policy positions of multiple parties composing the legislature. In consensual democracies, multiple parties typically exercise or have the potential to exercise significant policy influence (Lijphart, 1984).

This section varies the extent to which government policies reflect power-sharing among all parties as opposed to being determined by a single party.

Alternatively to the baseline model — and at the other extreme — Section 4.3.1 analyzes the case where the implemented policy is a compromise among the policy positions of all the parties composing the parliament, without regard to whether these parties are in government or opposition, weighted by their seat shares. I refer to this specification as the *parliamentary-mean model* of policy (Merrill and Adams, 2007). Proposition 4.3 below demonstrates that under the parliamentary-mean model no type of pre-electoral alliance is sustainable (neither PECs nor mergers) and in equilibrium parties always run alone.

In reality, implemented policies do not go entirely to one party or coalition, not are a pure compromise among all parties in the legislature. Section 4.3.2 takes into account intermediate configurations of institutional power sharing. Whether the policy-making process resembles more the centralized-party model or the parliamentary-mean one depends on country-specific power sharing arrangements that vary the extent to which power is concentrated or shared with minority parties. The analysis of this unified model shows that pre-electoral alliances (both mergers and PECs) can emerge in equilibrium

under intermediate power sharing arrangements.

4.3.1 Parliamentary-Mean Model

Let the implemented policy be a function of parties' platforms (z_i) and their legislative power, measured by seat shares. For simplicity, I assume that parties' seat shares are exactly proportional to vote shares, or in other words that the electoral system is perfectly proportional.[19] Then, the implemented policy function is

$$\hat{x}_t(z_i) = \sum_{i=l,c,r} V_{i,t} \times z_i. \tag{4.19}$$

This formulation reflects the weight each party has in the post-electoral bargaining process in the legislature. The next result describes the equilibrium of the game under the parliamentary-mean assumption of policy outcomes.

Proposition 4.3. Parliamentary-Mean Equilibrium. *Let the implemented policy be an average of all parties' preferred policies, weighted by parties' vote shares. In equilibrium, neither mergers nor PECs are sustainable, and parties run alone in both periods.*

Proposition 4.3 shows that institutions that promote compromise and power-sharing among political parties remove parties' need to join pre-electoral alliances to have their platform counted in the implemented policy. In other words, under consensual political institutions there is no premium for the winner of the election in terms of legislative power.

[19] The degree to which a PR system resembles perfect proportionality in reality depends on many factors such as district magnitude (i.e. the number of seats awarded per district) and the existence (or absence) of electoral thresholds defined in terms of a minimum percentage of the national vote a party must win in order to guarantee parliamentary representation (Shugart and Taagepera, 1989, Cox, 1997, Lijphart, 2012). Among the most perfectly proportional systems are those of Israel, the Netherlands, and the Scandinavian countries (Lijphart, 2012).

To see why no pre-electoral alliances emerge in equilibrium, let us analyze first parties' decision to form PECs vis-à-vis running alone in the second period. Contrary to the baseline model, where the implemented policy is determined by the winner of the election, the implemented policy under the parliamentary mean model reflects parties' compromise and bargaining taking place after the election. Intuitively, in the second period PECs are always weakly dominated by the choice of running alone because post-electoral negotiations can always reach a policy that is obtained with PECs.

The first period decision is not as trivial as the second period's one because of parties' uncertainty over the electorate's volatility. Because the first period payoff from forming a merger or a PEC is the same,[20] we can focus on parties' comparison of the different continuation values of each alliance configuration. The Appendix shows that there exist a parameter configuration such that C prefers to merge rather than running alone when electoral volatility is high. This result is due to the concavity of parties' preferences over policies: by merging, the centrist party could prevent a higher policy cost due to one of the extreme parties' policies being weighted more. However, mergers are not incentive compatible for neither L or R, which always prefer to run alone for any value of electoral volatility. Thus, in equilibrium no merger forms in the first period and parties compete alone in both periods.

4.3.2 Intermediate Configurations of Power-Sharing

Let $\alpha \in [0, 1]$ denote the amount of inter-party power sharing in the electoral environment, and consider the following implemented policy:

$$\hat{x}_t(z_i) = \alpha \left(\sum_{i=l,c,r} V_{i,t} \times z_i \right) + (1 - \alpha) z_w, \tag{4.20}$$

[20] Recall that the policy resulting from a merger and a PEC between the same parties are equivalent *in the same period*, while leading to different implemented policies in the subsequent period.

where z_w is the policy preferred by the party (or coalition) with the plurality of votes. The baseline model assumes that $\alpha = 0$, whereas the parliamentary mean model introduced in the previous section assumes that $\alpha = 1$. Majoritarian democracies concentrate power in the hands of the winning parties, in such a way that the outcome of the policy making process coincides with the dominant party's preferred policy ($\alpha = 0$). Conversely, in consensual democracies resources are more evenly shared with minority parties, which results in implemented policies partly reflecting the minority's preferences ($\alpha = 1$).

Empirically, a change in α might refer to a change in the electoral system (e.g., from winner-take-all to proportional), or to an institutional change holding fixed the electoral system's proportionality (e.g., from executive dominance to legislative-executive balance). Factors that disperse power among parties in the legislature (increasing α) include required supermajorities, bicameral legislatures and provisions for opposition parties' participation on important legislative committees. Factors that promote policy dominance by a single party or by the governing coalition (decreasing α) include restrictive legislative procedures (Huber, 1996), unicameral legislatures, and centralized government vis-à-vis federal systems.

We are interested in knowing whether there exists an intermediate level of power sharing that induces parties to form pre-electoral alliances. In other words, is there an $\alpha \in (0, 1)$ such that either mergers or PECs are sustainable in equilibrium? The subsequent numerical example illustrates parties' incentives under different values of α.[21]

Let $z_l = -0.6$, $z_c = 0$ and $z_r = 0.7$, as in the example in Section 4.2.4. Figure 4.7 shows the equilibrium configuration of alliances for different values of α as a function of electoral volatility. We know from Proposition 4.3 that for $\alpha = 1$ no merger is possible in equilibrium, since these are not incentive compatible for either L or R. As α goes down,

[21] Unfortunately the complexity of the objective makes an analytic characterization of the equilibrium difficult.

the implemented policy weighs more the platform of the dominant party. This in turn restores the incentives to merge of L and R. In the left panel of Figure 4.7 α is set to 0.3: for this value, party R is willing to accept a merger proposal from C. As α decreases further, the advantaged party L is willing to accept C's merger proposal: the right panel of Figure 4.7 shows the equilibrium for $\alpha = 0.1$. As the system converges to the dominant model of the baseline, both mergers and PECs are sustainable in equilibrium: when $\alpha = 0$ the parameter region describing the equilibrium is the one in Figure 4.5.

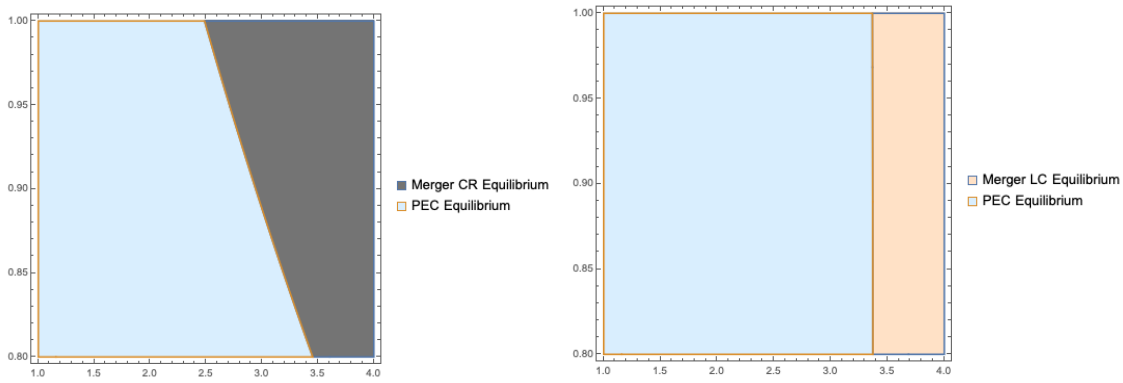

Figure 4.7: Equilibrium type as a function of ψ (x axis) and parties' discount factor δ (y axis), for $\alpha = 0.3$ (left panel) and $\alpha = 0.1$ (right panel). Parties' bliss points are set to $z_l = -0.6$, $z_c = 0$, $z_r = 0.7$. Voters bliss points are uniformly distributed in $[-1, 1]$.

4.4 Introducing Uncertainty over Platforms' Location

While each party is associated with a particular policy (its "brand"), z_i, parties typically feature heterogeneous preferences inside them. This heterogeneity is crucial, as the policy platform that is chosen by each party in a given election might differ from its policy brand (or, in other words, parties cannot fully pre-commit to policies). This section formalizes this idea by introducing noise in the location of parties' platforms.

Let $x_{i,t}$ be the policy platform that is selected by party i in a given election. This platform corresponds to the realization of the random variable $X_{i,t} = z_i + \epsilon$, where $\epsilon \sim \mathcal{N}(0, \sigma^2)$.

The smaller ϵ, the sharpest the message of the party (i.e., the most informative the party brand). We can interpret the support of X_i as follows. Parties typically gather multiple candidates who are proponents of different issues, some of which might be very far from the party brand. Depending on which of these candidates wins the election, the party policy could differ from the ex-ante party brand.

When L and C *merge* the resulting policy is a convex combination of the constituent parties' bliss points:

$$X^m_{lc,1} = z^m_{lc,1} + \epsilon^m, \tag{4.21}$$

where $\epsilon^m \sim \mathcal{N}(0, \sigma^2_m)$, and

$$\sigma^2_m = \sigma^2 + \frac{|z_l - z_c|}{\gamma}. \tag{4.22}$$

By creating a new political entity, mergers decreases the informativeness of the constituent parties' brands: for any distinct pair of platforms z_l and z_c, $\sigma^2_m > \sigma^2$ for any $\gamma \in \mathbb{R}_+$. The noise that arises from a merger is increasing in the distance between its constituent parties' bliss points: since voters expect candidates to be drawn from anywhere between z_c and z_l, the uncertainty cost increases with the distance among platforms.[22] Furthermore, the noise is decreasing in γ: as $\gamma \to \infty$, $\sigma^2_m \to \sigma^2$. As such, γ could be interpreted as the amount of trust between the merger's partners.[23] The merged party's brand $z^m_{lc,1}$ is a convex combination of the constituent parties' bliss points, as in the baseline model (4.1): $z^m_{lc,1} = \lambda_{l,1} z_l + (1 - \lambda_{l,1}) z_c$, where $\lambda_{l,1} = \frac{1}{2} + \phi\left(V_{l,1} - V_{c,1}\right)$.

Differently from mergers, PECs preserve the identity of different parties. Thus, when two parties form a PEC the noise term is the same as when parties run individually:

[22] This assumption is supported by empirical evidence showing that mergers are more likely to form between ideologically close parties (Ibenskas, 2016).

[23] When deciding to merge, a party faces the risk that the other partner would renege on the agreement by increasing its policy influence above the agreed at the time of the merger. While I leave it exogenous, it is reasonable to think γ to be positively correlated with the constituent parties' previous experience of governing together, which can reduce the uncertainty about partners' behavior (Franklin and Mackie, 1983, Martin and Stevenson, 2010).

$\epsilon \sim \mathcal{N}(0, \sigma^2)$.

Because parties cannot pre-commit to policies, voters do not know the exact policy each party selects and suffer an uncertainty cost which is captured by the variance of X_i. Formally, voter v's expected payoff from party i's platform is

$$\begin{aligned} EU_v(X_i) &= \mathbb{E}\big[- \big(X_i - z_v\big)^2 \big] \\ &= -\big(z_i - z_v\big)^2 - \sigma^2, \end{aligned} \tag{4.23}$$

where $z_i = \mathbb{E}[X_i]$ and $\sigma^2 = \text{Var}[X_i]$.[24]

To compute each party's vote share when parties run alone, we need to identify the location of the indifferent voter for each pair of parties. Since σ^2 is constant across parties, we can focus on the comparison between pairs of party brands (l, c and c, r), as in the baseline model.[25] The same holds when evaluating a PEC's vote share, because of the assumption on the noise term.

The analysis changes when computing the vote share of a merger. Denote by $v^m_{lc,r,2}$ the voter who is indifferent between party R and a merger between L and C in the second period. That is, $v^m_{lc,r,2}$ solves:

$$- \big(v^m_{lc,r,2} - z^m_{lc,2}\big)^2 - \sigma^2 - \frac{|z_l - z_c|}{\gamma} = -\big(v^m_{lc,r,2} - z_{r,2}\big)^2 - \sigma^2. \tag{4.24}$$

From the indifference condition (4.24) it is clear that parties sacrifice at least some of their vote share when deciding to merge (vis-à-vis forming a PEC). This is because

[24] The second equality follows from $\text{Var}[X_i] = \mathbb{E}[X_i^2] - \mathbb{E}[X_i]^2 = \sigma^2$, which allows to re-express $EU_v(X_i)$ as

$$\begin{aligned} EU_v(X_i) &= -\sigma^2 - \mathbb{E}[X_i]^2 + 2\mathbb{E}[X_i]z_v - z_v^2 \\ &= -\big(\mathbb{E}[X_i]^2 - 2\mathbb{E}[X_i]z_v + z_v^2\big) - \sigma^2. \end{aligned}$$

[25] For instance, let $v_{lc,2}$ be the voter who is indifferent between parties l and c in $t = 2$. Then, $v_{lc,2}$ solves the same indifference condition as in the baseline model, because the variance terms σ^2 cancel out.

— when z_l and z_c differ — voters pay an uncertainty cost when voting for a merged party. Despite this cost from merging, the next result shows that the trade-off identified in Proposition 4.2 holds, as long as the uncertainty cost associated to the merger is not too high.

Proposition 4.4. Equilibrium with Electoral Uncertainty. *When γ is high enough, in equilibrium parties form mergers when electoral volatility is sufficiently high (low ψ), and PECs for low electoral volatility (high ψ). When γ is low, in equilibrium C forms a PEC with the closest party (R).*

Intuitively, Proposition 4.4 shows that mergers are only sustainable if they don't introduce excessive uncertainty about where the party platform stands. This can be the case for example when the merged party has a clear statute which is credible given the constituent parties' histories. Low uncertainty can also be a reasonable assumption if constituent parties have been former allies or have had previous experience of governing together. Conversely, Proposition 4.4 shows that when voters' uncertainty about the new political party is high, a merger is not a viable alternative to a PEC *even when the electorate is very volatile*.

4.5 Conclusion

The majority of multi-party systems are extremely "liquid" (Powell Jr, 2000, Golder, 2006): parties split, merge, form and leave coalitions at all times, and these movements largely affect parties' electoral chances. While the literature typically assumes that each party is associated to a particular policy platform — highlighting the important role of parties in producing political brand names (Downs, 1957, Snyder and Ting, 2002) —, in multi-party systems each party is often associated to different brands depending on the allies chosen.

Thus, in the context of multi-party competition it is unclear "who owns the party

brand," given the different alliances parties can form. This is an unfortunate gap because understanding the different forms of inter-party cooperation is crucial for anticipating the development of party systems. To fill such void, this paper presents a simple model of electoral competition in which parties form alliances before elections, and decide how binding these alliances should be.

The central intuition of the model is that parties' strategic choice of electoral alliances crucially depends on the underlying volatility of the electorate. In particular, Proposition 4.2 suggests that stable electorates might incentivize flexible types of coalitions that are renegotiated in every election. Conversely, unstable electorates might be empirically correlated with more binding alliances such as mergers. Recent political developments have brought attention to the electoral decline of established parties and the burst of electoral volatility following the Great Recession of 2007 in Europe. The result suggests that this increased electoral volatility might lead to an increase in the number of binding coalitions in the future.

The model produces several empirical implications. Results suggest that we should expect mergers to be empirically associated with volatile electorates. In principle, an accurate measure of electoral volatility should reflect the extent to which personal votes change between subsequent elections. Thus, individual level data identifying voters' intentions to vote or party identification across time represent an accurate measure of volatility.

Results also show that at least some degree of power concentration is needed to trigger mergers and pre-electoral coalitions. Under consensual democracies that share power among all parties, minority parties do not need to join pre-electoral alliances to have their voices heard in the policy-making process. As power gets more concentrated in the hands of the winner of the election, parties need to join forces and both PECs and mergers can emerge in equilibrium. A decrease in power sharing might refer to a change in the

electoral system (e.g., from proportional to winner-take-all), or to an institutional change holding fixed the electoral system's proportionality (e.g., from legislative-executive balance to executive dominance).

While identifying future governments in two-party systems such as the United States is straightforward, it is unusual for almost every other democracy for a single party to win the majority of votes, making the identity of government more uncertain. By making explicit the identity of future governments, pre-electoral alliances (both mergers and PECs) have the important role of creating mandate conditions in multi-party systems.

These findings contribute to our understanding of party systems. Binding alliances such as mergers can reduce excessive party system fragmentation by forming stable parties. In the short term, however, mergers can reduce the information value of party labels for voters thus hindering voter representation and accountability. Ultimately, understanding the outcomes of party system formation and stabilization is not possible without considering the role of mergers and pre-electoral coalitions. While this paper only begins to unpack the incentives behind different forms of pre-electoral alliances, future research should further investigate how these incentives change with alternative institutional and non-institutional features of the competitive environment in which parties operate.

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Appendix A: Appendix to Chapter 2

A.1 Preliminaries

A.1.1 Faction's Problem

Faction L_1's problem is:

$$\max_{e_1^L \in [0,1]} \quad p^L \left[b_v^L + \rho_1^L \pi_v^L \right] + (1 - p^L) \left[b_d^L + \rho_1^L \pi_d^L - (x^L - x^R)^2 \right] - \frac{\left(e_1^L\right)^2}{2} - \frac{\left(1 - e_1^L\right)^2}{2}, \tag{A.1}$$

where $\rho_1^L = \frac{1}{2} + (1 - \gamma)(e_1^L - e_2^L)/2$ and $p^L = \frac{1}{2} + \psi[-(x^L)^2 + (x^R)^2 + e_1^L + e_2^L - e_1^R - e_2^R]$.

All the other factions solve their respective maximization problem. The first-order condition associated to L_1 is

$$2e^L = 1 + \left(\frac{1 - \gamma}{2} \right) \left[p^L \pi_v^L + (1 - p^L) \pi_d^L \right] + \psi \left[b_v^L - b_d^L + \rho_1^L (\pi_v^L - \pi_d^L) + \left(x^L - x^R \right)^2 \right] \tag{A.2}$$

and likewise for L_2, R_1 and R_2.

First, notice that the factions' objective function is concave. The second-order condition can be expressed as

$$\psi \left(1 - \gamma \right) \left(\pi_v^L - \pi_d^L \right) - 2,$$

which is negative for ψ sufficiently small. Hence, the first-order conditions of the factions' problem identify a maximum.

Lemma A.1. *There exists an equilibrium, i.e., a solution to the system of first-order conditions of each faction. The equilibrium is unique.*

Proof. Solving the system of four first-order conditions yields a unique closed-form solution for effort exerted by factions in both parties. The solution is symmetric for factions in the same party, i.e., $e_1^{L*} = e_2^{L*} = e^{L*}$, and equal to

$$e^{L*} = \frac{\big[(\gamma-1)(\pi_d^R - \pi_v^R)\psi - 2\big]\big[2 + (2\alpha-1)\psi + 2\psi(x^L - x^R)^2\big] + (\gamma-1)(\pi_v^L + \pi_d^L) - \theta(\pi_v^R)\pi_v^L + \theta(\pi_d^R)\pi_d^L}{4\big[-2 + \psi(\gamma-1)(\pi_d^R + \pi_d^L - \pi_v^R - \pi_v^L)\big]},$$

$$e^{R*} = \frac{\big[(\gamma-1)(\pi_d^L - \pi_v^L)\psi - 2\big]\big[2 + (2\alpha-1)\psi + 2\psi(x^L - x^R)^2\big] + (\gamma-1)(\pi_v^R + \pi_d^R) - \theta(\pi_v^L)\pi_v^R + \theta(\pi_d^L)\pi_d^R}{4\big[-2 + \psi(\gamma-1)(\pi_d^L + \pi_d^R - \pi_v^L - \pi_v^R)\big]},$$

where $\theta(\pi)$, for $\pi = \{\pi_d^L, \pi_v^L, \pi_d^R, \pi_v^R\}$, equals

$$\theta(\pi) = \psi\big[\pi(1-\gamma) + 2 + 2[(x^L)^2 - (x^R)^2] + \psi(1-2\alpha) + 2\psi(x^L - x^R)^2\big],$$

and has the following properties:

- If $\gamma < 1$ ($\gamma > 1$), $\theta(\pi)$ is increasing (decreasing) in π,
- If $(x^L)^2 > (x^R)^2$ (i.e., if party L is electorally disadvantaged) and $\gamma < 1$, $\theta(\pi)$ is positive.

□

Claim 1 (**Interior Effort.**). *The following condition ensures that* $e^{L*} \in (0,1)$*:*

$$\alpha + (x^L - x^R)^2 < \frac{1}{2\psi} \tag{A.3}$$

Proof. (I) Condition for $e^{L*} < 1$**.**

Using the expression for the faction's first-order condition (A.2), we can evaluate when

the first-order condition evaluated at $e^{L*} = 1$ is negative:

$$\psi\Big[(b_v^L - b_d^L) + \frac{1 + (1-\gamma)(1-e_2^L)}{2}(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\Big] + \frac{1-\gamma}{4}(\pi_v^L + \pi_d^L)$$
$$+ \psi\Big(\frac{1-\gamma}{2}\Big)\Big[-(x^L)^2 + (x^R)^2 + 1 + e_2^L - e_1^R - e_2^R\Big] < 1,$$

for which a sufficient condition is

$$\alpha + (x^L - x^R)^2 < \frac{1}{2\psi}. \tag{A.4}$$

(II) Condition for $e^{L*} > 0$. Using the expression for the faction's first-order condition (A.2) we can evaluate when the first-order condition evaluated at $e^{L*} = 0$ is positive:

$$\psi\Big[(b_v^L - b_d^L) + \frac{1 + (1-\gamma)(-e_2^L)}{2}(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\Big] + \frac{1-\gamma}{4}(\pi_v^L + \pi_d^L)$$
$$+ \psi\Big(\frac{1-\gamma}{2}\Big)\Big[-(x^L)^2 + (x^R)^2 + e_2^L - e_1^R - e_2^R\Big] > 0,$$

where the LHS is greater than

$$\psi\Big(\frac{\alpha - 1}{2}\Big) + 1.$$

Hence, the following is a sufficient condition for campaigning effort to be positive in equilibrium:

$$(1 - \alpha) < \frac{2}{\psi}, \tag{A.5}$$

which is again satisfied for ψ small enough.

Since effort is continuous, the conditions identified in (A.4) and (A.5) ensure that the unique level of effort exerted by factions in equilibrium must be interior. □

A.1.2 Party Leader's Problem

Each party leader maximizes the probability of winning the election with respect to the party's two premia. By Lemma A.1, we know that when L_1, L_2 face a symmetric problem, in equilibrium $e_1^{L*} = e_2^{L*} = e^{L*}$. This allows us to re-write L's objective as:

$$\max_{\pi_d^L, \pi_v^L} \quad u^L(\pi_d^L, \pi_v^L) = \frac{1}{2} + \psi\left[2e^{L*}\left(\pi_d^L, \pi_v^L\right) - 2e^{R*}\left(\pi_d^L, \pi_v^L\right) - (x^L)^2 + (x^R)^2\right]. \tag{A.6}$$

Since party P's premia affect the probability of winning only through the effort level of party P's factions as well as party Q's factions, we can re-express the leader's objective (A.6) as the maximization of the following transformed utility:

$$\max_{\pi_d^L, \pi_v^L} \quad \tilde{u}^L(\pi_d^L, \pi_v^L) = 2e^{L*}\left(\pi_d^L, \pi_v^L\right) - 2e^{R*}\left(\pi_d^L, \pi_v^L\right).$$

Notice that the game between the two party leaders is a zero-sum game, as each leader wins what the other party loses:

$$\tilde{u}^L(\pi^L, \pi^R) + \tilde{u}^R(\pi^L, \pi^R) = 2e^{L*} - 2e^{R*} + \left(2e^{R*} - 2e^{L*}\right) = 0. \tag{A.7}$$

Given Equation A.7, we can define the payoff function of this zero-sum game as $\tilde{u}^L(\pi^L, \pi^R) = u$, with $\tilde{u}^R(\pi^L, \pi^R) = -u$.

Party L's leader maxmin value is given by

$$\underline{v}^L = \max_{\{\pi_d^L, \pi_v^L\}} \quad \min_{\{\pi_d^R, \pi_v^R\}} \tilde{u}^L(\pi_d^L, \pi_v^L, \pi_d^R, \pi_v^R) \tag{A.8}$$

and party R's leader maxmin value is given by

$$\underline{v}^R = \max_{\{\pi_d^R, \pi_v^R\}} \quad \min_{\{\pi_d^L, \pi_v^L\}} -\tilde{u}^L(\pi_d^L, \pi_v^L, \pi_d^R, \pi_v^R) = \min_{\{\pi_d^R, \pi_v^R\}} \quad \max_{\{\pi_d^L, \pi_v^L\}} \tilde{u}^L(\pi_d^L, \pi_v^L, \pi_d^R, \pi_v^R).$$

Substituting the values of equilibrium efforts into (A.7), we can express the payoff function of the game in closed-form as follows:

$$u = \frac{(\gamma-1)\Big[\pi_d^L - \pi_d^R + \pi_v^L - \pi_v^R + 2\psi\big(\pi_d^L + \pi_d^R - \pi_v^L - \pi_v^R\big)\big(x_L^2 - x_R^2\big)\Big]}{-4 + 2(\gamma-1)\psi\big(\pi_d^L + \pi_d^R - \pi_v^L - \pi_v^R\big)}, \tag{A.9}$$

where $\tilde{u}^L(\pi^L, \pi^R) = u$, and $\tilde{u}^R(\pi^L, \pi^R) = -u$. Hence, L (R) maximizes (minimizes) the payoff function (A.9) with respect to $\boldsymbol{\pi^L}$ ($\boldsymbol{\pi^R}$).

Lemma A.2. *The payoff function of the game u is*

- *increasing in π_v^L for $\gamma < 1$*
- *decreasing in π_v^L for $\gamma > 1$*

Proof. Recall that the payoff function of the zero-sum game among party leaders is defined by $u = 2e^{L*} - 2e^{R*}$. By symmetry across factions in the same party, we can rewrite the first-order condition of L_1, L_2 as

$$2e = 1 + \psi\big(b_v^L + \rho_1^L \pi_v^L\big) + p^L\Big(\frac{1-\gamma}{2}\Big)\pi_v^L - \psi\big(b_d^L + \rho_1^L \pi_d^L\big) + (1-p^L)\Big(\frac{1-\gamma}{2}\Big)\pi_d^L \tag{A.10}$$

Taking the partial derivative of the faction's equilibrium effort (A.10) with respect to π_v^L yields

$$\frac{\partial 2e^{L*}}{\partial \pi_v^L} = \Big(\frac{1-\gamma}{2}\Big)\Big[p^L + \psi\Big(\frac{\partial 2e^{L*}}{\partial \pi_v^L} - \frac{\partial 2e^{R*}}{\partial \pi_v^L}\Big)\big(\pi_v^L - \pi_d^L\big)\Big] + \psi\Big[-\frac{1}{2} + \rho_1^L\Big], \tag{A.11}$$

which follows from the budget constraint assumption on b_v^L, the fact that $\partial p^L / \partial e^{L*} = 2\psi$ and that $\partial \rho_1^L / \partial \pi_v^L = 0$ in equilibrium. Define $\mathcal{X}_1$ as

$$\mathcal{X}_1 := 2\Big(\frac{\partial e^{L*}}{\partial \pi_v^L} - \frac{\partial e^{R*}}{\partial \pi_v^L}\Big),$$

and notice that in equilibrium $\rho_1^L = 1/2$. Then, the partial derivative of effort with respect to π_v^L (A.11) can be simplified to

$$\frac{\partial 2e^{L*}}{\partial \pi_v^L} = \Big(\frac{1-\gamma}{2}\Big)\Big[p^L + \psi\mathcal{X}_1\big(\pi_v^L - \pi_d^L\big)\Big], \tag{A.12}$$

where $2e^{L*}$ is the first component of L's payoff function. Next, we need to characterize $\partial 2e^{R*}/\partial \pi_v^L$. To do so, observe that

$$\frac{\partial 2e^{L*}}{\partial \pi_v^R} = \Big(\frac{1-\gamma}{2}\Big)\Big[\psi\Big(\frac{\partial 2e^{L*}}{\partial \pi_v^R} - \frac{\partial 2e^{R*}}{\partial \pi_v^R}\Big)\big(\pi_v^L - \pi_d^L\big)\Big].$$

Hence, by symmetry

$$\frac{\partial 2e^{R*}}{\partial \pi_v^L} = \Big(\frac{1-\gamma}{2}\Big)\Big[\psi\Big(\frac{\partial 2e^{R*}}{\partial \pi_v^L} - \frac{\partial 2e^{L*}}{\partial \pi_v^L}\Big)\big(\pi_v^R - \pi_d^R\big)\Big],$$

which is equivalent to

$$\frac{\partial 2e^{R*}}{\partial \pi_v^L} = \Big(\frac{1-\gamma}{2}\Big)\psi(-\mathcal{X}_1)\big(\pi_v^R - \pi_d^R\big). \tag{A.13}$$

Using (A.12) and (A.13) we can re-express $2\Big(\frac{\partial e^{L*}}{\partial \pi_v^L} - \frac{\partial e^{R*}}{\partial \pi_v^L}\Big)$ as

$$\mathcal{X}_1 = \Big(\frac{1-\gamma}{2}\Big)p^L + \Big(\frac{1-\gamma}{2}\Big)\psi\mathcal{X}_1\big(\pi_v^L - \pi_d^L\big) + \Big(\frac{1-\gamma}{2}\Big)\psi\mathcal{X}_1\big(\pi_v^R - \pi_d^R\big),$$

which rearranged yields

$$\mathcal{X}_1\Big[1 - \frac{1-\gamma}{2}\psi\big(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R\big)\Big] = \Big(\frac{1-\gamma}{2}\Big)p^L.$$

Substituting back $\mathcal{X}_1 = 2\Big(\frac{\partial e^{L*}}{\partial \pi_v^L} - \frac{\partial e^{R*}}{\partial \pi_v^L}\Big)$ allows us to evaluate how the payoff function

changes with π_1:

$$2\Big(\frac{\partial e^{L*}}{\partial \pi_v^L} - \frac{\partial e^{R*}}{\partial \pi_v^L}\Big) = \frac{\Big(\frac{1-\gamma}{2}\Big)p^L}{2-(1-\gamma)\psi\big(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R\big)}.$$

Notice that $\big(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R\big) \in [0, 2\alpha] \subset [0,2]$. Hence the denominator is positive either when $\gamma > 1$, or for $\gamma < 1$ and ψ small enough. When this is the case, the sign of $\mathcal{X}_1$ is driven by the numerator, which is positive when $\gamma < 1$ and negative when $\gamma > 1$, which completes the proof. □

Lemma A.3. *The payoff function of the game u is*

- *increasing in π_d^L for $\gamma < 1$*
- *decreasing in π_d^L for $\gamma > 1$*

Proof. Taking the partial derivative of the faction's equilibrium effort (A.10) with respect to π_d^L yields

$$\frac{\partial 2e^{L*}}{\partial \pi_d^L} = \Big(\frac{1-\gamma}{2}\Big)\Big[\psi\Big(\frac{\partial 2e^{L*}}{\partial \pi_v^L} - \frac{\partial 2e^{R*}}{\partial \pi_v^L}\Big)\big(\pi_v^L - \pi_d^L\big) + (1-p^L)\Big] + \psi\Big[-\frac{1}{2} + \rho_1^L\Big], \tag{A.14}$$

Let $\mathcal{X}_0 := 2\Big(\frac{\partial e^{L*}}{\partial \pi_d^L} - \frac{\partial e^{R*}}{\partial \pi_d^L}\Big)$. Then, (A.14) simplifies to

$$\frac{\partial 2e^{L*}}{\partial \pi_d^L} = \Big(\frac{1-\gamma}{2}\Big)\Big[2\psi\mathcal{X}_0\big(\pi_v^L - \pi_d^L\big) + 1 - p^L\Big] - \psi, \tag{A.15}$$

which is the first component of the payoff function.

Next, we need to characterize $\frac{\partial 2e^{R*}}{\partial \pi_d^L}$. To do so, observe that

$$\frac{\partial 2e^{L*}}{\partial \pi_d^R} = \Big(\frac{1-\gamma}{2}\Big)\Big[\psi\Big(\frac{\partial 2e^{L*}}{\partial \pi_d^R} - \frac{\partial 2e^{R*}}{\partial \pi_d^R}\Big)\big(\pi_v^L - \pi_d^L\big)\Big].$$

Hence, by symmetry

$$\frac{\partial 2e^{R*}}{\partial \pi_d^L} = \Big(\frac{1-\gamma}{2}\Big)\Big[\psi\Big(\frac{\partial 2e^{R*}}{\partial \pi_d^L} - \frac{\partial 2e^{L*}}{\partial \pi_d^L}\Big)\big(\pi_v^R - \pi_d^R\big)\Big],$$

which is equivalent to

$$\frac{\partial 2e^{R*}}{\partial \pi_v^L} = \Big(\frac{1-\gamma}{2}\Big)\psi(-\mathcal{X}_0)\big(\pi_v^R - \pi_d^R\big). \tag{A.16}$$

Using (A.15) and (A.16) we can re-express $2\Big(\frac{\partial e^{L*}}{\partial \pi_d^L} - \frac{\partial e^{R*}}{\partial \pi_d^L}\Big)$ as

$$\mathcal{X}_0 = \Big(\frac{1-\gamma}{2}\Big)\psi\mathcal{X}_0\big(\pi_v^L - \pi_d^L\big) + \Big(\frac{1-\gamma}{2}\Big)(1-p^L) - \psi + \Big(\frac{1-\gamma}{2}\Big)\psi\mathcal{X}_0\big(\pi_v^R - \pi_d^R\big),$$

which rearranged yields

$$\mathcal{X}_0\Big[1 - \frac{1-\gamma}{2}\psi\big(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R\big)\Big] = \Big(\frac{1-\gamma}{2}\Big)(1-p^L) - \psi.$$

Substituting back $\mathcal{X}_0 = 2\Big(\frac{\partial e^{L*}}{\partial \pi_d^L} - \frac{\partial e^{R*}}{\partial \pi_d^L}\Big)$ allows us to evaluate how the payoff function changes with π_d:

$$2\Big(\frac{\partial e^{L*}}{\partial \pi_d^L} - \frac{\partial e^{R*}}{\partial \pi_d^L}\Big) = \frac{\Big(\frac{1-\gamma}{2}\Big)(1-p^L) - \psi}{2 - (1-\gamma)\psi\big(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R\big)}.$$

As in the previous case, the denominator is positive either when $\gamma > 1$, or for $\gamma < 1$ and ψ small enough. When this is the case, the sign of $\mathcal{X}_0$ is driven by the numerator, which is positive when $\gamma < 1$ (for ψ small enough) and negative when $\gamma > 1$, which completes the proof. □

A.2 Main Results

A.2.1 Proof of Proposition 2.1

Proof. To derive the equilibrium incentive scheme, notice that by Lemma A.2 and Lemma A.3 the following is true when $\gamma < 1$:

$$\frac{\partial e^{L*}}{\partial \pi_d^L} - \frac{\partial e^{R*}}{\partial \pi_d^L} > 0$$
$$\frac{\partial e^{L*}}{\partial \pi_v^L} - \frac{\partial e^{R*}}{\partial \pi_v^L} > 0.$$

Thus, in equilibrium L sets $\pi_d^{L*} = (1-\alpha)$, $\pi_v^{L*} = \alpha$. When $\gamma > 1$, the inequality is reversed, therefore the optimal premia are $\pi_d^{L*} = \pi_v^{L*} = 0$.

Given the payoff of the game (A.9), the right party faces a problem that is symmetric to L's one, i.e., $\max_{\{\pi_d^R, \pi_v^R\}}\{-u\}$. Therefore, R sets in equilibrium $\pi_d^R = (1-\alpha)$, $\pi_v^R = \alpha$ when $\gamma < 1$, and $\pi_d^R = \pi_v^R = 0$ when $\gamma > 1$.

When no party has an ex-ante electoral advantage over the other, faction L_1 solves the following problem:

$$\max_{e_1^L \in [0,1]} \left\{ \begin{array}{c} \left[\frac{1}{2} + \psi(e_1^L + e_2^L - e_1^R - e_2^R)\right]\left[b_v^L + \left(\frac{1}{2} + \frac{(1-\gamma)(e_1^L - e_2^L)}{2}\right)\pi_v^L\right] + \\ \left[\frac{1}{2} - \psi(e_1^L + e_2^L - e_1^R - e_2^R)\right]\left[b_d^L + \left(\frac{1}{2} + \frac{(1-\gamma)(e_1^L - e_2^L)}{2}\right)\pi_d^L - \left(x^L - x^R\right)^2\right] \\ -\frac{(e_1^L)^2}{2} - \frac{(1-e_1^L)^2}{2} \end{array} \right\}.$$

The first-order condition associated to faction L_1 is:

$$\psi\left[b_v^L + \left(\frac{1}{2} + \frac{(1-\gamma)(e_1^L - e_2^L)}{2}\right)\pi_v^L\right] - \psi\left[b_d^L + \left(\frac{1}{2} + \frac{(1-\gamma)(e_1^L - e_2^L)}{2}\right)\pi_d^L - (x^L - x^R)^2\right] +$$
$$\frac{1-\gamma}{2}\pi_v^L\left[\frac{1}{2} + \psi(e_1^L + e_2^L - e_1^R - e_2^R)\right] + \frac{1-\gamma}{2}\pi_d^L\left[\frac{1}{2} - \psi(e_1^L + e_2^L - e_1^R - e_2^R)\right] + 1 - 2e_1^L = 0,$$

and likewise for faction L_2 in party L and factions R_1 and R_2 in party R. Solving the system

of four first order conditions, one for each faction, yields a unique solution for e_1^L,e_2^L,e_1^R,e_2^R:

$$e^{L*} = \frac{\begin{array}{c}[(\gamma-1)(\pi_d^R-\pi_v^R)\psi-2][2+(2\alpha-1+2(x_L-x_R)^2)\psi]+(\gamma-1)\pi_v^L(1+\psi)(-2+(\gamma-1)\pi_v^R \\ +(2\alpha-1-2(x_L-x_R)^2)\psi)+(\gamma-1)\pi_d^L(1+\psi(2+\pi_d^R-\gamma\pi_d^R+[2\alpha-1+2(x_L-x_R)^2)\psi)]\end{array}}{4\psi(\gamma-1)(\pi_d^L+\pi_d^R-\pi_v^L-\pi_v^R)-8} \tag{A.17}$$

and, analogously, effort chosen by factions in party R is equal to

$$e^{R*} = \frac{\begin{array}{c}[(\gamma-1)(\pi_d^L-\pi_v^L)\psi-2][2+(2\alpha-1+2(x_L-x_R)^2)\psi]+(\gamma-1)\pi_v^R(1+\psi)(-2+(\gamma-1)\pi_v^L \\ +(2\alpha-1-2(x_L-x_R)^2)\psi)+(\gamma-1)\pi_d^L(1+\psi(2+\pi_d^L-\gamma\pi_d^R+[2\alpha-1+2(x_L-x_R)^2)\psi)]\end{array}}{4\psi(\gamma-1)(\pi_d^R+\pi_d^L-\pi_v^R-\pi_v^L)-8} \tag{A.18}$$

Substituting the equilibrium premia yields

$$e^{L*} = \begin{cases} \dfrac{2+\psi\left(2\alpha-1+2\left(x^L-x^R\right)^2\right)}{4} & \text{if} \quad \gamma > 1 \\ \dfrac{5-\gamma+2\psi\left(2\alpha-1+2\left(x^L-x^R\right)^2\right)}{8} & \text{if} \quad \gamma < 1, \end{cases}$$

which completes the proof. □

A.2.2 Proof of Proposition 2.2

Proof. (i) The proof simply follows by inspection of the first-order conditions and by observing that an increase in polarization $\left(x^L - x^R\right)$ only increases the external incentive term.

(ii) The following first-order condition identifies equilibrium effort of factions in party L:

$$\psi\left(b_v^L+\rho_1^L\pi_v^L\right)+p^L\left(\frac{1-\gamma}{2}\right)\pi_v^L-\psi\left[b_d^L+\rho_1^L\pi_d^L-\left(x^L-x^R\right)^2\right]+(1-p^L)\left(\frac{1-\gamma}{2}\right)\pi_d^L+1-2e^L=0,$$

and can be re-expressed as

$$2e^L = 1 + \left(\frac{1-\gamma}{2}\right)\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] + \psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + \left(x^L - x^R\right)^2\right].$$

Differentiating with respect to $|x^L|$ yields

$$\begin{aligned}\frac{\partial 2e^L}{\partial|x^L|} &= \left(\frac{1-\gamma}{2}\right)\frac{\partial p^L}{\partial|x^L|}(\pi_v^L - \pi_d^L) + 2\psi\left(x^L - x^R\right) \\ &= -(1-\gamma)\psi|x^L|(\pi_v^L - \pi_d^L) + 2\psi\left(x^L - x^R\right), \end{aligned} \tag{A.19}$$

where the second equality follows from $\partial p^L/\partial|x^L| = -2\psi|x^L|$.

Differentiating with respect to $|x^R|$ yields

$$\begin{aligned}\frac{\partial 2e^L}{\partial|x^R|} &= \left(\frac{1-\gamma}{2}\right)\frac{\partial p^L}{\partial x^R}(\pi_v^L - \pi_d^L) - 2\psi\left(x^L - x^R\right) \\ &= (1-\gamma)\psi x^R(\pi_v^L - \pi_d^L) - 2\psi\left(x^L - x^R\right).\end{aligned}$$

By symmetry:

$$\frac{\partial 2e^R}{\partial|x^L|} = -(1-\gamma)\psi|x^L|(\pi_v^R - \pi_d^R) + 2\psi\left(x^L - x^R\right).$$

Differentiating $(2e^L - 2e^R)$ with respect to $|x^L|$ yields

$$\frac{\partial(2e^L - 2e^R)}{\partial|x^L|} = -(1-\gamma)\psi|x^L|(\pi_v^L + \pi_v^R - \pi_d^L - \pi_d^R). \tag{A.20}$$

In equilibrium, when $\gamma < 1$ the optimal contract offered by both leaders is $\pi_v^{L*} = \pi_v^{R*} = \alpha$, and $\pi_d^{L*} = \pi_d^{R*} = 1 - \alpha$. Substituting the optimal contract yields

$$\frac{\partial(2e^{L*} - 2e^{R*})}{\partial|x^L|} = -2(1-\gamma)\psi|x^L|(2\alpha - 1),$$

which is always negative. That is, the difference in equilibrium efforts ($2e^{L*} - 2e^{R*}$) decreases in L's ideological extremism. The proof of $\frac{\partial(2e^{R*}-2e^{L*})}{\partial|x^R|} < 0$ is analogous therefore omitted.

Finally, when $\gamma > 1$, the optimal contract offered by both leaders is $\pi_v^{L*} = \pi_v^{R*} = \pi_d^{L*} = \pi_d^{R*} = 0$, which substituted into (A.20) yields zero for every x^L. □

A.2.3 Proof of Remark 2.1

Proof. Differentiating $\mathcal{W}^L(x^L)$ with respect to $|x^L|$ yields

$$\frac{\partial \mathcal{W}^L(x^L)}{\partial|x^L|} = \frac{\partial p^L}{\partial|x^L|}\left[2\alpha - 1 + 2\left(x^L - x^R\right)^2\right] - 4|x^L - x^R|\left(1 - p^L\right),$$

where

$$\frac{\partial p^L(x^L)}{\partial|x^L|} = -2\psi|x^L| < 0,$$

which is always negative. □

A.2.4 Proof of Proposition 2.3

Proof. When factions are heterogeneous, we can express L_1's first-order condition as

$$e_1^{L*} = \frac{1}{2} + \left(\frac{1-\gamma}{4}\right)\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] + \frac{\psi}{2}\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) - \left(x_1^L - x^L\right)^2 + \left(x_1^L - x^R\right)^2\right], \quad \text{(A.21)}$$

and L_2's first-order condition as

$$e_2^{L*} = \frac{1}{2} + \left(\frac{1-\gamma}{4}\right)\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] + \frac{\psi}{2}\left[b_v^L - b_d^L + \left(1-\rho_1^L\right)(\pi_v^L - \pi_d^L) - \left(x_2^L - x^L\right)^2 + \left(x_2^L - x^R\right)^2\right], \quad \text{(A.22)}$$

By inspection of the last term of the first-order condition in (A.21) and (A.22), it is clear that $e_1^{L*} > e_2^{L*}$ for $|x_1^L| > |x_2^L|$.

To derive the equilibrium incentive scheme, first take the sum $e_1^{L*} + e_2^{L*}$:

$$e_1^{L*}+e_2^{L*} = 1+\left(\frac{1-\gamma}{2}\right)\left[\pi_d^L+2p^L(\pi_v^L-\pi_d^L)\right]+\frac{\psi}{2}\left[2\alpha-1-\left(x_1^L-x^L\right)^2+\left(x_1^L-x^R\right)^2-\left(x_2^L-x^L\right)^2+\left(x_2^L-x^R\right)^2\right].$$

Differentiating $e_1^{L*} + e_2^{L*}$ with respect to π_v^L yields

$$\frac{\partial(e_1^{L*} + e_2^{L*})}{\partial \pi_v^L} = \frac{1-\gamma}{2}\left[p^L + \frac{\partial p^L}{\partial \pi_v^L}(\pi_v^L - \pi_d^L)\right].$$

Analogously:

$$e_1^{R*}+e_2^{R*} = 1+\left(\frac{1-\gamma}{2}\right)\left[\pi_v^R+2(1-p^L)(\pi_d^R-\pi_v^R)\right]+\frac{\psi}{2}\left[2\alpha-1-\left(x_1^R-x^R\right)^2+\left(x_1^R-x^L\right)^2-\left(x_2^R-x^R\right)^2+\left(x_2^R-x^L\right)^2\right],$$

and

$$\frac{\partial(e_1^{R*} + e_2^{R*})}{\partial \pi_v^L} = \frac{(1-\gamma)}{2}\frac{\partial p^L}{\partial \pi_v^L}(\pi_d^R - \pi_v^R).$$

Define χ as $\frac{\partial(e_1^{L*}+e_2^{L*}-e_1^{R*}-e_2^{R*})}{\partial \pi_v^L}$. We have:

$$\chi = \frac{1-\gamma}{2}\left[p^L + \frac{\partial p^L}{\partial \pi_v^L}(\pi_v^L - \pi_d^L - \pi_d^R + \pi_v^R)\right]. \tag{A.23}$$

Since

$$\frac{\partial p^L}{\partial \pi_v^L} = \psi\frac{\partial(e_1^{L*} + e_j^{L*} - e_1^{R*} - e_2^{R*})}{\partial \pi_v^L} = \psi\chi,$$

the expression for χ (A.23) can be re-written as

$$\chi = \frac{\partial(e_1^{L*} + e_2^{L*} - e_1^{R*} - e_2^{R*})}{\partial \pi_v^L} = \frac{p^L}{\frac{2}{1-\gamma} - \psi(\pi_v^L - \pi_d^L - \pi_d^R + \pi_v^R)},$$

which is positive for $\gamma < 1$ and ψ small enough. This implies $\pi_v^{L*} = \alpha$. The sign of the derivative is negative for $\gamma > 1$, which implies $\pi_v^{L*} = 0$. The proof for π_d^{L*} is analogous

and therefore omitted. □

A.2.5 Proof of Proposition 2.4

Proof. Faction L_1's realized payoff from winning the election and ranking high within the party is

$$\begin{aligned} u_1^L(\pi_v^L, s^L = 1) &= b_v^L + \pi_v^L - \left(x_1^L - \left(\lambda x_1^L + (1-\lambda)x_2^L\right)\right)^2 - \frac{(e_1^L)^2}{2} - \frac{(1-e_1^L)^2}{2} \\ &= b_v^L + \pi_v^L - (1-\lambda)^2(x_1^L - x_2^L)^2 - \frac{(e_1^L)^2}{2} - \frac{(1-e_1^L)^2}{2} \end{aligned} \tag{A.24}$$

Similarly, L_1's realized payoff from winning the election and ranking low is

$$u_1^L(\pi_v^L, s^L = 2) = b_v^L - \lambda^2(x_2^L - x_1^L)^2 - \frac{(e_1^L)^2}{2} - \frac{(1-e_1^L)^2}{2}. \tag{A.25}$$

Given these expressions, we can write L_1's first-order condition as

$$\begin{aligned} e_1^{L*} =& \frac{1}{2} + \frac{\psi}{2}\left[b_v^L - b_d^L + \rho_1^L\left(\pi_v^L - \pi_d^L - (1-\lambda)^2(x_1^L - x_2^L)^2\right) - \left(1-\rho_1^L\right)\lambda^2(x_2^L - x_1^L)^2 + \left(x_i^L - x^R\right)^2\right] \\ &+ \left(\frac{1-\gamma}{2}\right)\left[\pi_d^L + p^L(\pi_v^L - \pi_d^L) - (1-\lambda)^2(x_1^L - x_2^L)^2 + \lambda^2(x_2^L - x_1^L)^2\right]. \end{aligned} \tag{A.26}$$

Similarly, we can write L_2's first-order condition as

$$\begin{aligned} e_2^{L*} =& \frac{1}{2} + \frac{\psi}{2}\left[b_v^L - b_d^L + \left(1-\rho_1^L\right)\left(\pi_v^L - \pi_d^L - (1-\lambda)^2(x_2^L - x_1^L)^2\right) - \rho_1^L\lambda^2(x_1^L - x_2^L)^2 + \left(x_i^L - x^R\right)^2\right] \\ &+ \left(\frac{1-\gamma}{2}\right)\left[\pi_d^L + p^L(\pi_v^L - \pi_d^L) - (1-\lambda)^2(x_2^L - x_1^L)^2 + \lambda^2(x_1^L - x_2^L)^2\right]. \end{aligned} \tag{A.27}$$

Summing the two factions' equilibrium efforts after substituting the budget constraint and simplifying yields

$$\begin{aligned} e_1^{L*} + e_2^{L*} =& 1 + \frac{\psi}{2}\left[2\alpha - 1 - (\lambda^2 + (1-\lambda)^2)(x_2^L - x_1^L)^2 + \left(x_1^L - x^R\right)^2 + \left(x_2^L - x^R\right)^2\right] \\ &+ (1-\gamma)\Big[\pi_d^L + p^L(\pi_v^L - \pi_d^L) + p^L(x_2^L - x_1^L)^2(2\lambda - 1)\Big], \end{aligned}$$

from which we can differentiate with respect to λ to obtain

$$\frac{\partial(e_1^{L*} + e_2^{L*})}{\partial\lambda} = -(2\lambda-1)\psi\left(x_2^L - x_1^L\right)^2 + (1-\gamma)\left[\frac{\partial p^L}{\partial\lambda}\left(\pi_v^L - \pi_d^L + (x_2^L - x_1^L)^2(2\lambda-1)\right) + 2p^L\left(x_2^L - x_1^L\right)^2\right].$$

Similarly, summing the first-order conditions of factions in *right* yields

$$e_1^{R*} + e_2^{R*} = 1 + \frac{\psi}{2}\left[2\alpha - 1 - (x_1^R - x^R)^2 + \left(x_2^R - x^R\right)^2 + \left(x_1^R - x^L\right)^2 + \left(x_2^R - x^L\right)^2\right] + (1-\gamma)\left[\pi_v^R + p^L(\pi_d^R - \pi_v^R)\right],$$

from which we can differentiate with respect to λ to obtain

$$\frac{\partial(e_1^{R*} + e_2^{R*})}{\partial\lambda} = (1-\gamma)\frac{\partial p^L}{\partial\lambda}\left(\pi_d^R - \pi_v^R\right).$$

Define χ_λ as

$$\chi_\lambda \equiv \frac{\partial(e_1^{L*} + e_2^{L*} - e_1^{R*} - e_2^{R*})}{\partial\lambda}.$$

We have:

$$\chi_\lambda = (1-2\lambda)\psi\left(x_2^L - x_1^L\right)^2 + (1-\gamma)\psi\chi_\lambda\left(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R + (x_2^L - x_1^L)^2(2\lambda-1)\right) + 2p^L\left(x_2^L - x_1^L\right)^2,$$

which simplified yields

$$\chi_\lambda = \frac{(x_2^L - x_1^L)^2\Big[2p^L + \psi(2\lambda - 1)\Big]}{1 - \big(1-\gamma\big)\psi\left(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R + (x_2^L - x_1^L)^2(2\lambda - 1)\right)}. \tag{A.28}$$

The numerator of (A.28) is always positive, as $\lambda \in [1/2, 1]$. The denominator is positive when

$$(1-\gamma)\big[\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R + (x_2^L - x_1^L)^2(2\lambda - 1)\big] < \frac{1}{\psi}. \tag{A.29}$$

When $\gamma > 1$, the LHS in (A.29) is always negative, which implies that in equilibrium $\lambda^* = 1$. That is, when sabotage is more effective than campaigning effort it is always optimal to set a policy concession for the faction ranking higher. Since premia are constrained to be nonnegative, in this case there is no trade-off between eliciting campaigning and setting a winning platform.

When $\gamma < 1$, the sign of LHS in (A.29) depends on the value of $(x_2^L - x_1^L)^2$. A sufficient condition for the denominator of χ_λ (A.28) to be positive is

$$2\alpha + (x_2^L - x_1^L)^2(2\lambda - 1) < \frac{1}{\psi(1-\gamma)}, \tag{A.30}$$

which requires the distance in factions' ideological bliss point to be low enough. A sufficient condition for the denominator to be negative is

$$(x_2^L - x_1^L)^2(2\lambda - 1) > \frac{1}{\psi(1-\gamma)} + 2(1-\alpha), \tag{A.31}$$

which requires the distance in factions' ideological bliss point to be high enough. That is, when the ideological distance is high enough and $\gamma < 1$, the optimal incentive scheme sets low powered incentives. When the distance is low enough, the optimal incentive scheme features high powered incentives.

Lastly, we need to derive the optimal premia. To do so, notice that

$$\frac{\partial(e_1^{L*} + e_2^{L*})}{\partial \pi_v^L} = (1-\gamma)\left[\frac{\partial p^L}{\partial \pi_v^L}\left(\pi_v^L - \pi_d^L + (x_2^L - x_1^L)^2(2\lambda - 1)\right) + p^L\right], \tag{A.32}$$

and

$$\frac{\partial(e_1^{R*} + e_2^{R*})}{\partial \pi_v^L} = (1-\gamma)\frac{\partial p^L}{\partial \pi_v^L}\left(\pi_d^R - \pi_v^R\right), \tag{A.33}$$

which yields

$$\frac{\partial(e_1^{L*} + e_2^{L*} - e_1^{R*} - e_2^{R*})}{\partial \pi_v^L} = \frac{p^L}{\frac{1}{1-\gamma} - \psi\left[\pi_v^L - \pi_d^L - \pi_d^R + \pi_v^R + (x_2^L - x_1^L)^2(2\lambda - 1)\right)\right]}. \tag{A.34}$$

By inspection, $\partial p^L / \partial \pi_v^L < 0$ for $\gamma > 1$, and $\partial p^L / \partial \pi_v^L > 0$ for $\gamma < 1$ and ψ small enough — which completes the proof. □

A.3 Extensions

A.3.1 Negative Premia

In the baseline model, the leader is constrained to choose an incentive scheme which rewards the faction that ranks higher according to internal monitoring device with non-negative premia. That is, when sabotage is more effective than campaigning to get a high ranking, the leader cannot "punish" the winning faction by setting a negative premium (or, alternatively, the losing faction cannot be rewarded). This assumption reflects the fact that leaders are often constrained by parties' legal rules and formal procedures, which are the same for all factions and are decided ex-ante.[1]

However, from a theoretical standpoint one might argue that the party should rec-

[1] The assumption that leaders cannot renege on contracts is supported by the evidence on historical factions presented in the paper, which shows that these set of rules can even take the form of explicit contracts, as in the Italian case.

ognize and avoid such inefficient metrics, and be able to punish factions that mobilize less. That is, when $\gamma > 1$, negative premia should be strictly better than positive ones: by promising all the electoral spoils to the lower-ranking faction, leaders can ensure higher campaigning effort. In terms of information inferred from the ranking indicator, if negative premia are allowed, then having the ranking indicator increasing in mobilization effort is equivalent to having it increasing in sabotage. The main results of the baseline model are robust to a specification which allows leaders to punish high ranking factions.

Corollary A.1 (**Equilibrium with negative premia**). *When premia can be negative, the optimal premia offered by L in equilibrium (and, symmetrically, by R) are* $(\pi_d^{L*}, \pi_v^{L*}) = (\alpha - 1, -\alpha)$ *if* $\gamma > 1$, *and* $(\pi_d^{L*}, \pi_v^{L*}) = (1 - \alpha, \alpha)$ *if* $\gamma < 1$.

Proof. The proof directly follows from Lemma A.2 and A.3, which show that the leader's expected payoff is strictly increasing (decreasing) in both premia when $\gamma < 1$ ($\gamma > 1$). □

Intuitively, the highest incentive to invest in campaigning effort coincides with a punishment for ranking higher when $\gamma > 1$. When the factions' incentives are aligned to those of the leader ($\gamma < 1$), high powered incentives are optimal, as in the baseline model.

How does allowing for negative premia change the equilibrium investment decision of factions? The baseline model shows that factions in extreme parties campaign less than factions in moderate parties when $\gamma < 1$. Extending the analysis to negative premia shows that this is true for every value of γ, i.e.,

$$\frac{\partial \left(e^{L*} - e^{R*}\right)}{\partial |x^L|} < 0.$$

Since it is equivalent to have the internal ranking determined by sabotage or campaigning, the effect of polarization on campaigning effort is the same whether $\gamma > 1$ or $\gamma < 1$.

The baseline model also shows that, when factions are heterogeneous, rewarding sabotage with a positive premium contingent on electoral victory increases the moderate

faction's campaigning. This result is robust to a specification that allows for negative premia. In particular, in this case the difference between total effort in party L and total effort in party R is decreasing in the value of the extreme faction's preferred policy, $|x_i^L|$.

Finally, the result on policy concessions is also robust to a specification allowing for negative premia. In particular, when $\gamma > 1$ and the extreme faction's preferred policy is extreme enough, the leader sets $\lambda^* = 1$, thus rewarding the moderate faction with a policy concession.

A.3.2 Non-binding Resource Constraint

The baseline model assumes $a_i^L + e_i^L = 1$ — that is, effort (e_i^L) and sabotage (a_i^L) exhaust the faction's unitary budget of resources. In what follows I analyze the general case $a_i^L + e_i^L \leq 1$. I show that in equilibrium (i) effort must be positive, (ii) sabotage is either positive or zero. That is, both $a_i^{L*} > 0,\ e_i^{L*} > 0$ and $a_i^{L*} = 0,\ e_i^{L*} > 0$ are possible in equilibrium.

Consider the decision of faction L_1 in party L. There is a total budget normalized to 1, and the following condition must hold: $a_i^L + e_i^L \leq 1$, that is, doing nothing is an option for factions. Faction 1's maximization problem is

$$\begin{aligned} \max_{e_1^L, a_1^L} \quad & p^L\left[b_v^L + \rho_1^L \pi_v^L\right] + (1 - p^L)\left[b_d^L + \rho_1^L \pi_d^L - (x^L - x^R)^2\right] - \frac{(e_1^L)^2}{2} - \frac{(a_1^L)^2}{2} \\ \text{s. t.} \quad & e_1^L + a_1^L \leq 1, \\ & e_1^L, a_1^L \geq 0. \end{aligned}$$

where $p^L = \frac{1}{2} + \psi\left[-(x^L)^2 + (x^R)^2 + e_1^L + e_2^L - e_1^R - e_2^R\right]$ and $\rho_1^L = \frac{1}{2} + \frac{(e_1^L - e_2^L) + \gamma(a_1^L - a_2^L)}{\phi}$. For simplicity, but without loss of generality, let $x^L = -x^R$ (no party has an ex-ante electoral advantage).

The Lagrangean associated with L_1's problem can be expressed as

$$\mathcal{L}(e_1^L, a_1^L) = p^L\left[b_v^L + \rho_1^L \pi_v^L\right] + (1-p^L)\left[b_d^L + \rho_1^L \pi_d^L - (x^L - x^R)^2\right] - \frac{(e_1^L)^2}{2} - \frac{(a_1^L)^2}{2}$$
$$- \lambda_1(a_1^L + e_1^L - 1) + \lambda_2(e_1^L) + \lambda_3(a_1^L)$$

The optimization problem satisfies the constraint qualifications, hence we know that the solution of the faction's maximization is the solution of the following Karush-Kuhn-Tucker conditions:

(1) $\psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[p^L \pi_v^L + (1-p^L)\pi_d^L\right] - e_1^L - \lambda_1 + \lambda_2 = 0$

(2) $\frac{\gamma}{\phi}\left[p^L \pi_v^L + (1-p^L)\pi_d^L\right] - a_1^L - \lambda_1 + \lambda_3 = 0$

(3) $a_1^L + e_1^L - 1 \leq 0 \quad \wedge \quad \lambda_1\left[a_1^L + e_1^L - 1\right] = 0$

(4) $e_1^L \geq 0 \quad \wedge \quad \lambda_2\left(e_1^L\right) = 0$

(5) $a_1^L \geq 0 \quad \wedge \quad \lambda_3\left(a_1^L\right) = 0$

(6) $\lambda_1 \geq 0,\ \lambda_2 \geq 0,\ \lambda_3 \geq 0.$

where conditions (1) and (2) are the first order conditions with respect to e_1^L and a_1^L.

Before proceeding with the cases to evaluate, notice that the following holds in equilibrium:

- $e_1^{L*} = e_2^{L*}$ and $a_1^{L*} = a_2^{L*}$, which implies $\rho_1^L = 1/2$
- Since $x^L = -x^R$, we have $p^L(e_1^{L*}, e_2^{L*}, e_1^{R*}, e_2^{R*}) = 1/2$

Given the inequality constraint, there are four cases to consider.

(I) $a_1^L > 0,\ e_1^L > 0.$ Then, $\lambda_2 = \lambda_3 = 0$ from conditions (4) and (5). We can find the

value of λ_1 from condition (1) and (2):

$$(1) \quad \psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] - e_1^L = \lambda_1$$

$$(2) \quad \frac{\gamma}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] - a_1^L = \lambda_1.$$

Substituting (1) into (2) yields

$$e_1^L - a_1^L = \psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\right] + \frac{1-\gamma}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right].$$

Recall that rewards are simply: $b_v^L = \frac{\alpha - \pi_v^L}{2}$ and $b_d^L = \frac{1-\alpha-\pi_d^L}{2}$. Hence we can re-write $e_1^L - a_1^L$ as

$$e_1^L - a_1^L = \psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] + \frac{1-\gamma}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right].$$

In equilibrium, effort is increasing (decreasing) in both premia when $\gamma < 1$ ($\gamma > 1$), hence premia are set to ($\pi_d^{L*} = 1-\alpha$, $\pi_v^{L*} = \alpha$) when $\gamma < 1$, and to ($\pi_d^{L*} = \pi_v^{L*} = 0$) when $\gamma > 1$. Substituting in (π_d^{L*}, π_v^{L*}), as well as $p^L = 1/2$ yields

$$a_i^{L*} = e_i^{L*} - \psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] - \mathbb{1}\{\gamma < 1\}\frac{1-\gamma}{\phi}. \tag{A.35}$$

which substituted into condition (1) yields

$$\lambda_1 = \mathbb{1}\{\gamma < 1\}\frac{1}{\phi} + \psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] - e_i^{L*},$$

where the first two terms are nonnegative because $\phi > 0, \psi > 0, \alpha \geq 1/2$. We can then find a sufficient condition for $\lambda_1 \geq 0$, which is

$$\psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] \geq 1 - \mathbb{1}\{\gamma < 1\}\frac{1}{\phi}.$$

(II) $a_1^L > 0,\ e_1^L = 0.$ Then, $\lambda_3 = 0$ from (5). We can find the value of λ_1 from condition (2):

$$(2) \quad \frac{\gamma}{\phi}\Big[p^L\pi_v^L + (1-p^L)\pi_d^L\Big] - a_1^L = \lambda_1.$$

But then, substituting the value found for λ_1 into (1) we get

$$(1) \quad \psi\Big[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\Big] + \frac{1-\gamma}{\phi}\Big[p^L\pi_v^L + (1-p^L)\pi_d^L\Big] + a_1^L + \lambda_2 = 0$$

which clearly contradicts $\lambda_2 \geq 0$.

(III) $a_1^L = 0,\ e_1^L > 0.$ Then, $\lambda_2 = 0$ from (4). We can find the value of λ_1 from condition (1):

$$(1) \quad \psi\Big[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\Big] + \frac{1}{\phi}\Big[p^L\pi_v^L + (1-p^L)\pi_d^L\Big] - e_1^L = \lambda_1,$$

which substituted into (2) yields

$$(2) \quad \frac{\gamma-1}{\phi}\Big[p^L\pi_v^L + (1-p^L)\pi_d^L\Big] - \psi\Big[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\Big] + e_1^L + \lambda_3 = 0.$$

In equilibrium,

$$\lambda_3 = \psi\Big[\alpha - \frac{1}{2} + (x^L - x^R)^2\Big] + \frac{1-\gamma}{\phi} - e_1^{L*}. \tag{A.36}$$

We can then find a sufficient condition for $\lambda_3 \geq 0$, which is

$$\psi\Big[\alpha - \frac{1}{2} + (x^L - x^R)^2\Big] \geq 1 - \frac{1-\gamma}{\phi},$$

which becomes harder to satisfy as γ increases.

(IV) $a_1^L = e_1^L = 0.$ Then, $\lambda_1 = 0$ from condition (3), and

$$(1) \quad \psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] + \lambda_2 \leq 0$$

$$(2) \quad \frac{\gamma}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] + \lambda_3 \leq 0,$$

which again contradicts $\lambda_2 \geq 0$ and $\lambda_3 \geq 0$.

A.3.3 Two Separate Actions - Different Cost Functions

The baseline model assumes (i) $a_1^L = 1 - e_1^L$ and (ii) separate quadratic costs for both actions. These assumptions imply that in equilibrium there is always a positive amount of sabotage (as equilibrium effort is interior) to minimize costs, even when $\gamma < 1$ — that is, even when sabotage is less effective than campaigning to achieve a high internal ranking. While Subsection A.3.2 relaxes (i) by analyzing the case $a_1^L + e_1^L \leq 1$, this section extends the analysis to consider two separate actions, $e_1^L \in [0,1]$ and $a_1^L \in [0,1]$, and different convex cost functions.

(I) Separate Quadratic Costs. Using the baseline model's cost function, faction L_1's maximization problem can be expressed as

$$\max_{e_1^L, a_1^L} \quad p^L\left[b_v^L + \rho_1^L\pi_v^L\right] + (1-p^L)\left[b_d^L + \rho_1^L\pi_d^L - (x^L - x^R)^2\right] - (e_1^L)^2 + (a_1^L)^2,$$

where $p^L = 1/2 + \psi(-x_L^2 + x_R^2 + e_1^L + e_2^L - e_1^R - e_2^R)$ and $\rho_1^L = 1/2 + \phi^{-1}[e_1^L - e_2^L + \gamma(a_1^L - a_2^L)]$. We start the analysis with the following observations.

Remark A.1. *Factions do not invest in sabotage ($a_i^{L*} = 0$) if and only if both premia are set to zero. When $\pi_v^L > 0$ and/or $\pi_d^L > 0$, in equilibrium factions exert some positive level of sabotage.*

Proof. To show this, observe that

$$\frac{\partial U_1^L}{\partial a_1^L} = \frac{\gamma}{\phi}\left[p^L \pi_v^L + (1-p^L)\pi_d^L\right] - 2a_1^L, \tag{A.37}$$

where $\partial U_1^L / \partial a_1^L \leq 0$ for every a_1^L if and only if $\pi_v^L = \pi_d^L = 0$. Hence, when premia are set to zero, $a_i^{L*} = 0$.

To show the second part of the claim, notice that when either premia is positive $\partial U_1^L / \partial a_1^L \geq 0$ at $a_1^L = 0$, implying $a_i^{L*} > 0$. □

Remark A.2. *Factions always exert positive effort in equilibrium.*

Proof. The proof simply follows by inspection of

$$\frac{\partial U_1^L}{\partial e_1^L} = \psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[p^L \pi_v^L + (1-p^L)\pi_d^L\right] - 2e_1^L, \tag{A.38}$$

which is positive at $e_1^L = 0$ for every value of the premia. □

Given these observations it follows that factions invest in sabotage in equilibrium for any incentive scheme which features non-negative premia. The following result derives the equilibrium incentive scheme, which always features positive premia. Given this result, it is always true that factions exert positive sabotage in equilibrium with separate quadratic cost of sabotage and effort.

Lemma A.4. *L's objective function is always increasing in both premia, implying* $\pi_v^{L*} = \alpha$, $\pi_d^{L*} = 1 - \alpha$.

Proof. The two first-order conditions of the faction's problem are:

$$2e_1^L = \psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L)\right] + \frac{1}{\phi}\left[p^L \pi_v^L + (1-p^L)\pi_d^L\right] \tag{A.39}$$

$$2a_1^L = \frac{\gamma}{\phi}\left[p^L \pi_v^L + (1-p^L)\pi_d^L\right] \tag{A.40}$$

Differentiating effort with respect to π_v^L yields:

$$\frac{\partial e_1^L}{\partial \pi_v^L} = \frac{\psi}{\phi}\left[\frac{\partial(e_1^L - e_2^L)}{\partial \pi_v^L} + \gamma \frac{\partial(a_1^L - a_2^L)}{\partial \pi_v^L}\right](\pi_v^L - \pi_d^L) + \psi\left[\frac{1}{2} + \frac{e_1^L - e_2^L}{2} + \gamma\left(\frac{a_1^L - a_2^L}{2}\right)\right] + \frac{1}{\phi}\left[p^L + \frac{\partial p^L}{\partial \pi_v^L}(\pi_v^L - \pi_d^L)\right]$$

When factions are symmetric (same ideological preferences) $a_1^{L*} = a_2^{L*}$ and $e_1^{L*} = e_2^{L*}$, which implies

$$\frac{\partial e^L}{\partial \pi_v^L} = \frac{\psi}{2} + \frac{1}{\phi}\left[p^L + \psi \frac{\partial 2(e^L - e^R)}{\partial \pi_v^L}(\pi_v^L - \pi_d^L)\right]$$

and

$$\frac{\partial e^L}{\partial \pi_v^R} = \frac{1}{\phi}\left[\psi \frac{\partial 2(e^L - e^R)}{\partial \pi_v^R}(\pi_v^L - \pi_d^L)\right].$$

By symmetry:

$$\frac{\partial e^R}{\partial \pi_v^L} = \frac{1}{\phi}\left[\psi \frac{\partial 2(e^R - e^L)}{\partial \pi_v^L}(\pi_v^R - \pi_d^R)\right],$$

which allows us to express L's objective function as

$$\frac{\partial(e^L - e^R)}{\partial \pi_v^L} = \frac{\psi}{2} + \frac{1}{\phi}p^L + \frac{2\psi}{\phi}\frac{\partial(e^L - e^R)}{\partial \pi_v^L}(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R)$$

Rearranging, we can easily see that

$$\frac{\partial(e^L - e^R)}{\partial \pi_v^L} = \frac{\frac{\psi}{2} + \frac{1}{\phi}p^L}{1 - \frac{2\psi}{\phi}(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R)},$$

which is positive for ϕ large enough. This implies $\pi_v^{L*} = \alpha$. The proof for $\pi_d^{L*} = 1 - \alpha$ is analogous and therefore omitted. □

Hence with this functional form assumption, the optimal premia do not depend on γ and are always set at the maximum. Premia are independent of γ because L does not internalize the cost of sabotage: with separate actions and separate costs for both actions, sabotage does not imply a lower investment in campaigning activities. The next cost

function restores this property of the model while keeping the two actions separate.

(II) Campaigning and Sabotage as Substitutes. Consider the following cost function

$$C(e_1^L, a_1^L) = (e_1^L + a_1^L)^2,$$

which preserves the crucial property of decreasing return of both activities, and that more investment in one activity increases the marginal cost of the other. The latter property is the fundamental reason why the leader might want to disincentivize sabotage in this setup: higher sabotage increases campaigning effort's marginal cost, thereby reducing the amount of equilibrium effort, which is what the leader seeks to maximize in order to win the election.

The two first-order conditions of the faction's problem can now be expressed as:

$$\begin{aligned} 2e_1^L &= \psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L) + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] - 2a_1^L, \qquad \text{(A.41)} \\ 2a_1^L &= \frac{\gamma}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] - 2e_1^L, \end{aligned}$$

from which we can conclude that $e_1^{L*} = a_1^{L*} = 0$ is never a solution. This simply follows by inspection of $\partial U_1^L/\partial e_1^L$, which is always positive at $e_i^{L*} = a_i^{L*} = 0$. Similarly, when $\gamma < 1$, effort must be positive as the next result shows.

Claim 2. *If $\gamma < 1$, $e_1^{L*} = 0$, $a_1^{L*} > 0$ is not a solution.*

Proof. Since $a_1^{L*} > 0$, we can replace a_1^{L*} into the first-order condition with respect to e_1^{L*} and obtain

$$\frac{\partial U_1}{\partial e_1^L} = \psi\left[b_v^L - b_d^L + \rho_1^L(\pi_v^L - \pi_d^L)\right] + \frac{1-\gamma}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right],$$

which is clearly positive, hence $e_1^{L*} > 0$. □

On the other hand, it is possible to have $e_1^{L*} > 0$, $a_1^{L*} = 0$. This happens in equilibrium when sabotage is less effective than effort, as the next result shows.

Claim 3. *If* $\gamma < 1$, $a_1^{L*} = 0$.

Proof. Suppose $a_1^L = 0$. Because of the budget constraint assumption and the fact that in equilibrium $e_1^{L*} = e_2^{L*}$, $a_1^{L*} = a_2^{L*}$, we can re-write the first-order condition with respect to e_1^L as

$$2e_1^L = \psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right],$$

which substituted into $\partial U_1^L/\partial a_1^L|_{a_1^L=0}$ yields the following condition:

$$\frac{\gamma-1}{\phi}\left[p^L\pi_v^L + (1-p^L)\pi_d^L\right] - \psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] < 0. \tag{A.42}$$

When the inequality holds, $a_1^{L*} = 0$. By inspection of (A.42), a sufficient condition for $\partial U_1^L/\partial a_1^L|_{a_1^L=0} < 0$ to hold is $\gamma < 1$, but it is not necessary: the condition also holds when both premia are zero or when the first term of the LHS is sufficiently low. □

The case left to establish is whether $e_1^{L*} > 0$, $a_1^{L*} > 0$ can be true in equilibrium. In order to prove it, it is first necessary to show what the optimal incentive scheme is. This is not straightforward: on the one hand, high powered incentives always elicit campaigning effort, on the other, when sabotage is highly effective high powered incentives might reduce campaigning via an increase in the marginal cost of effort. Finding the optimal incentive scheme when $e_1^L > 0$, $a_1^L > 0$ is not tractable because of the elevated number of first order conditions (8) that depend on each other. However, the next result shows that factions exert positive effort in equilibrium when $\pi_v^{L*} = \alpha$ and γ is large enough. The proof is organized as follows. I begin by assuming that $e_1^L > 0$, and $a_1^L = 0$. The proof shows that the equilibrium incentive conditional on an electoral victory is always $\pi_v^{L*} = \alpha$. Then, the optimal incentive is substituted in $\frac{\partial U_1^L}{\partial a_1^L}|_{a_1^L=0}$ to prove that, when γ is high enough, the sign

of the derivative is positive for every π_d^L, which implies that $a_1^{L*} > 0$. Intuitively, when γ is large the return from sabotage is high and factions invest in sabotage in equilibrium when incentives are high powered.

Claim 4. *When $\pi_v^{L*} = \alpha$ and γ is large enough, $e_1^{L*} > 0$, $a_1^{L*} > 0$.*

Proof. Consider the case $e_1^L > 0$, $a_1^L = 0$. Since $e_1^{L*} = e_2^{L*}$ and $a_1^{L*} = a_2^{L*}$, and by the budget constraint assumption $b_v^L + \pi_v^L/2 = \alpha/2$ and $b_d^L + \pi_d^L/2 = (1-\alpha)/2$, the first-order condition of L_1 with respect to e_1^L simplifies to

$$2e_1^L = \psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[p^L \pi_v^L + (1-p^L)\pi_d^L\right] \tag{A.43}$$

To find the optimal value of π_v^L, plug in the expression for p^L, and consider the symmetric first-order condition of faction R_1:

$$2e_1^L = \psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[\pi_d^L + \left(\frac{1}{2} + \psi(-x_L^2 + x_R^2 + 2e_1^L - 2e_1^R)\right)(\pi_v^L - \pi_d^L)\right],$$
$$2e_1^R = \psi\left[\alpha - \frac{1}{2} + (x^R - x^L)^2\right] + \frac{1}{\phi}\left[\pi_d^R + \left(\frac{1}{2} - \psi(-x_L^2 + x_R^2 + 2e_1^L - 2e_1^R)\right)(\pi_v^R - \pi_d^R)\right].$$

Subtracting $2(e_1^L - e_1^R)$ yields

$$2(e_1^L - e_1^R) = \frac{1}{\phi}\left[\pi_d^L - \pi_d^R + \left(\frac{1}{2} + \psi(-x_L^2 + x_R^2)\right)(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R) + \psi(2e_1^L - 2e_1^R)(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R)\right],$$

which can be re-expressed as

$$2(e_1^L - e_1^R) = \frac{(\frac{1}{2} + \psi(-x_L^2 + x_R^2))(\pi_v^L + \pi_v^R) + (\frac{1}{2} - \psi(-x_L^2 + x_R^2))(\pi_d^L + \pi_d^R)}{\phi - \psi(\pi_v^L - \pi_d^L + \pi_v^R - \pi_d^R)},$$

which is increasing in π_v^L: in the numerator π_v^L is pre-multiplied by the probability of victory of the left, and as π_v^L increases the negative term in the denominator becomes smaller. This is intuitive: increasing the power of the incentives increases equilibrium

campaigning effort, which is what the leader wants to maximize. Hence in equilibrium $\pi_v^{L*} = \alpha$. Substituting π_v^{L*} into $\partial U_1^L / \partial e_1^L = 0$ yields

$$2e_1^{L*} = \psi\left[\alpha - \frac{1}{2} + (x^L - x^R)^2\right] + \frac{1}{\phi}\left[p^L\alpha + (1 - p^L)\pi_d^{L*}\right],$$

where the optimal level of π_d^{L*} is unknown. Recall that $\frac{\partial U_1^L}{\partial a_1^L}|_{a_1^L=0}$ is

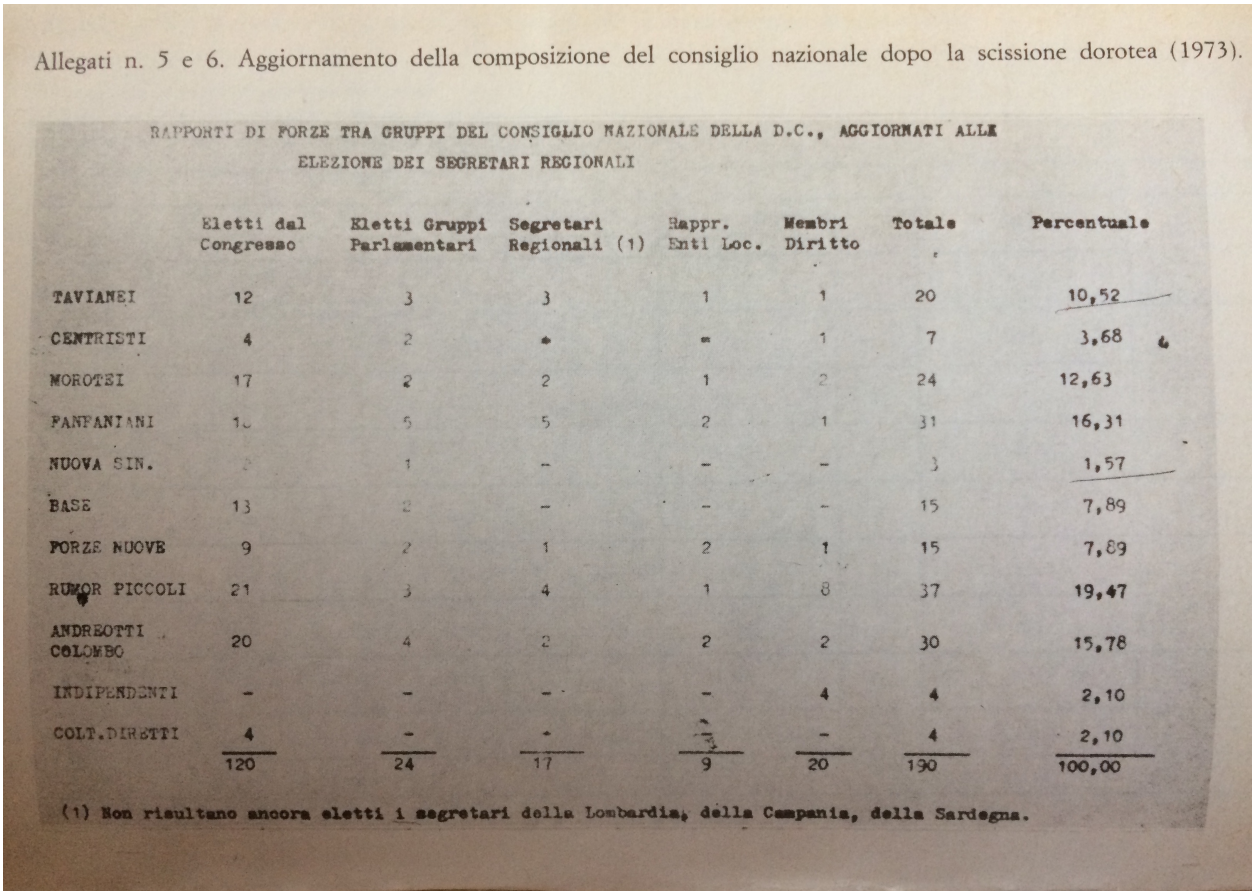
$$\frac{\gamma}{\phi}\left[p^L\pi_v^L + (1 - p^L)\pi_d^L\right] - 2e_1^L. \tag{A.44}$$

We want to show that $\frac{\partial U_1^L}{\partial a_1^L}|_{a_1^L=0}$ can be positive. To find a sufficient condition, consider $\pi_d^L = 0$. Substituting the equilibrium values expressions for e_1^{L*} and π_v^{L*} yields

$$\frac{\gamma - 1}{\phi}p^L\alpha - \psi\left(\alpha - \frac{1}{2}\right),$$

which is clearly positive for γ high enough. Hence it must be that, for $\gamma > \phi\psi/2$, in equilibrium $a_1^{L*} > 0$. □

A.4 Portfolio Allocation in Historical DC: From the Original Manual



Allegati n. 5 e 6. Aggiornamento della composizione del consiglio nazionale dopo la scissione dorotea (1973).

RAPPORTI DI FORZE TRA GRUPPI DEL CONSIGLIO NAZIONALE DELLA D.C., AGGIORNATI ALLA ELEZIONE DEI SEGRETARI REGIONALI

	Eletti dal Congresso	Eletti Gruppi Parlamentari	Segretari Regionali (1)	Rappr. Enti Loc.	Membri Diritto	Totale	Percentuale
TAVIANEI	12	3	3	1	1	20	10,52
CENTRISTI	4	2	-	-	1	7	3,68
MOROTEI	17	2	2	1	2	24	12,63
FANFANIANI	1[illegible]	[illegible]	5	2	1	31	16,31
NUOVA SIN.	[illegible]	1	-	-	-	3	1,57
BASE	13	2	-	-	-	15	7,89
FORZE NUOVE	9	2	1	2	1	15	7,89
RUMOR PICCOLI	21	3	4	1	8	37	19,47
ANDREOTTI COLOMBO	20	4	2	2	2	30	15,78
INDIPENDENTI	-	-	-	-	4	4	2,10
COLT.DIRETTI	4	-	-	-	-	4	2,10
	120	24	17	9	20	190	100,00

(1) Non risultano ancora eletti i segretari della Lombardia, della Campania, della Sardegna.

Figure A.1: **Portfolio Allocation Rule in Italian Christian Democracy (1973)** Factional division of seats following the method in the Cencelli manual. The left column displays the names of the different factions composing the DC in 1973. The second column displays the total number of elected members of each faction, as a function of the total percentage obtained in the party congress (last column on the right).

Appendix B: Appendix to Chapter 3

Table B.1: The Impact of Electoral Loss on Investigations Driven by a Political Leaker - with Party Fixed Effects

	(1)	(2)	(3)
Electoral Loss	0.050**	0.049**	0.049**
	[0.023]	[0.023]	[0.023]
Opinion Crime	0.977***	0.982***	0.980***
	[0.201]	[0.204]	[0.204]
Electoral Loss × Opinion Crime	-0.059*	-0.069**	-0.069**
	[0.033]	[0.034]	[0.034]
Party Size	0.037	0.038	
		[0.047]	[0.047]
Government		-0.539	-0.542
		[0.555]	[0.556]
External Support		-0.431	-0.410
		[0.549]	[0.559]
Corruption Salience			0.010
			[0.052]
Legislative Terms FE	Yes	Yes	Yes
Party FE	Yes	Yes	Yes
Observations	949	949	949

Notes: Logit estimations; coefficients reported. Dependent variable: dummy equal to one if the member of Parliament received a request for removal of parliamentary immunity initiated by another politician. Electoral Loss is measured as the difference in the vote share of the MP's party with respect to the previous election. Standard errors are indicated in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table B.2: The Impact of Electoral Loss on Investigations Driven by a Political Leaker - with Party Fixed Effects and District Fixed Effects

	(1)	(2)	(3)
Electoral Loss	0.062**	0.061**	0.060**
	[0.026]	[0.027]	[0.027]
Opinion Crime	1.291***	1.306***	1.306***
	[0.232]	[0.236]	[0.236]
Electoral Loss × Opinion Crime	-0.069*	-0.081**	-0.082**
	[0.036]	[0.037]	[0.037]
Party Size	0.046	0.050	
		[0.049]	[0.049]
Government		-0.598	-0.619
		[0.578]	[0.581]
External Support		-0.520	-0.431
		[0.571]	[0.580]
Corruption Salience			0.047
			[0.055]
Legislative Terms FE	Yes	Yes	Yes
Party FE	Yes	Yes	Yes
District FE	Yes	Yes	Yes
Observations	949	949	949

Notes: Logit estimations; coefficients reported. Dependent variable: dummy equal to one if the member of Parliament received a request for removal of parliamentary immunity initiated by another politician. Electoral Loss is measured as the difference in the vote share of the MP's party with respect to the previous election. Standard errors are indicated in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table B.3: Political Investigations and Time Elapsed from Crime - with Party Fixed Effects

	(1)	(2)	(3)
Political Leaker	435.678***	435.732***	433.441***
	[84.586]	[84.648]	[84.634]
Opinion Crime	-1,020.582***	-1,012.189***	-1,012.211***
	[98.214]	[98.894]	[98.856]
Political Leaker × Opinion Crime	-375.112***	-372.702***	-364.518***
	[129.099]	[129.173]	[129.279]
Electoral Loss	-12.171	-13.124	-12.247
	[8.301]	[8.492]	[8.516]
Party Size		2.330	0.582
		[19.083]	[19.124]
Government		18.470	37.605
		[217.498]	[217.918]
External Support		333.441	272.030
		[220.054]	[225.043]
Corruption Salience			-28.302
			[21.898]
Legislative Terms FE	Yes	Yes	Yes
Party FE	Yes	Yes	Yes
Observations	907	907	907

Notes: OLS estimations; coefficients reported. Dependent variable: time elapsed between (alleged) crime and RAP. Standard errors are indicated in brackets. *** p<0.01, ** p<0.05, * p<0.1.

Table B.4: Political Investigations and Time Elapsed from Crime, Interacted with Days to Election - with Party Fixed Effects

	(1)	(2)	(3)
Political Leaker	674.741***	704.691***	696.966***
	[144.712]	[146.506]	[146.715]
Days to Election	-0.093	-0.005	0.026
	[0.142]	[0.151]	[0.155]
Political Leaker × Days to Election	-0.569**	-0.634**	-0.621**
	[0.275]	[0.279]	[0.280]
Opinion Crime	-1,058.333***	-1,041.807***	-1,036.235***
	[147.602]	[161.843]	[161.943]
Political Leaker × Opinion Crime	-658.026***	-674.655***	-652.442***
	[209.989]	[233.996]	[235.074]
Opinion Crime × Days to Election	0.055	-0.028	-0.035
	[0.176]	[0.194]	[0.194]
Political Leaker × Opinion Crime	0.604*	0.683**	0.657*
	[0.315]	[0.334]	[0.335]
Electoral Loss		-8.933	-8.465
		[8.740]	[8.753]
Party Size		-3.593	-5.030
		[20.264]	[20.316]
Government		-22.155	3.870
		[237.265]	[238.722]
External Support		365.303	330.108
		[236.173]	[238.841]
Corruption Salience			-22.538
			[22.783]
Legislative Terms FE	Yes	Yes	Yes
Party FE	Yes	Yes	Yes
Observations	998	892	892

Notes: OLS estimations; coefficients reported. Dependent variable: time elapsed between (alleged) crime and RAP. Standard errors are indicated in brackets. *** p<0.01, ** p<0.05, * p<0.1.

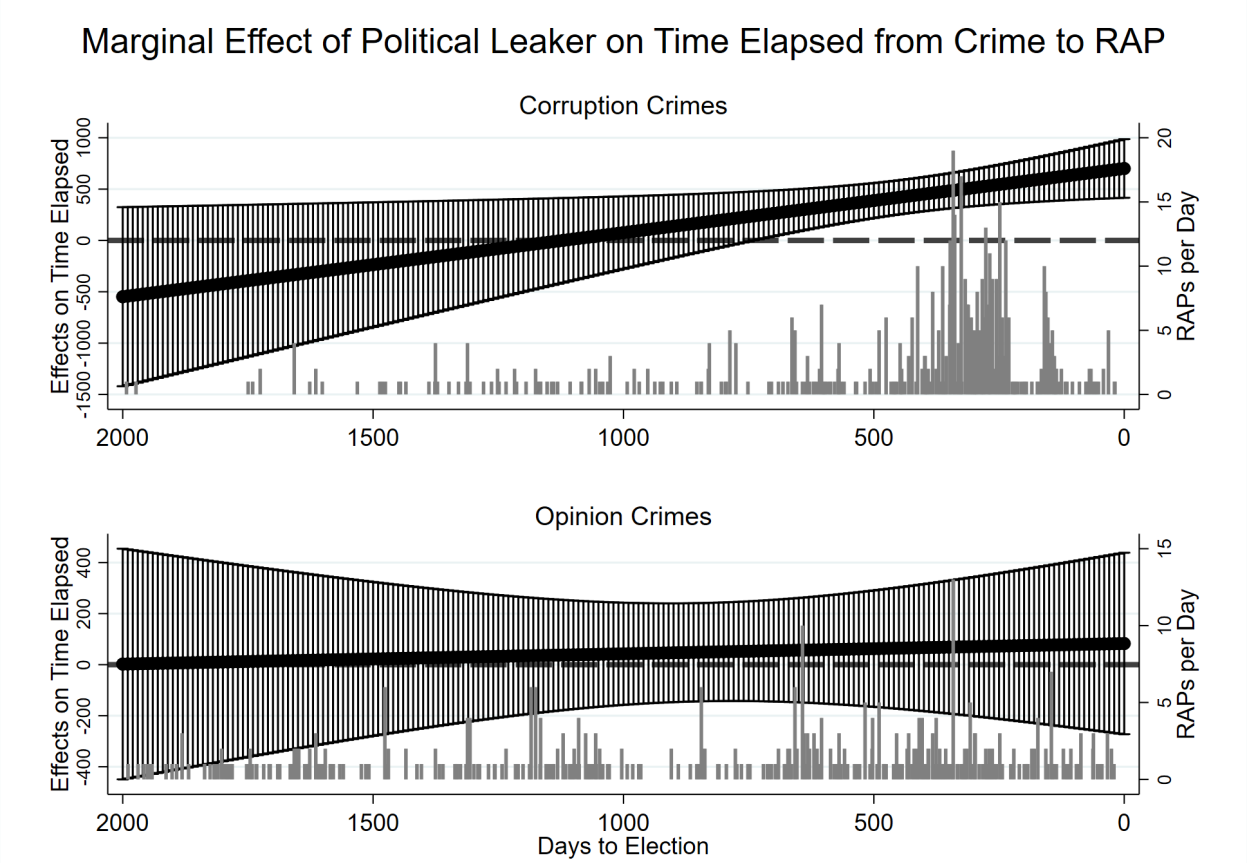


Figure B.1: Marginal effects of time elapsed from crime in days, for both corruption and opinion crimes.

B.6 Example of Request of Authorization to Proceed

CAMERA DEI DEPUTATI

Doc. IV
N. 153-A

RELAZIONE DELLA GIUNTA
PER LE AUTORIZZAZIONI A PROCEDERE

(Relatore: **FERRARI SILVESTRO**)

SULLA

DOMANDA DI AUTORIZZAZIONE A PROCEDERE IN GIUDIZIO

CONTRO IL DEPUTATO

FERRARI GIORGIO

PER I REATI DI CUI AGLI ARTICOLI 5, LETTERA *d*, E 6 DELLA LEGGE 30 APRILE 1962, N. 283 (VIOLAZIONI DELLE NORME PER LA DISCIPLINA IGIENICA DELLA PRODUZIONE E DELLA VENDITA DELLE SOSTANZE ALIMENTARI E DELLE BEVANDE) ED AGLI ARTICOLI 444 E 452 DEL CODICE PENALE (COMMERCIO COLPOSO DI SOSTANZE ALIMENTARI NOCIVE PER LA SALUTE PUBBLICA)

TRASMESSA DAL MINISTRO DI GRAZIA E GIUSTIZIA
(MARTINAZZOLI)

il 13 febbraio 1985

Presentata alla Presidenza l'11 aprile 1985

ONOREVOLI COLLEGHI ! — In data 13 febbraio 1985 è pervenuta alla Camera dei deputati, da parte del pretore di Padova, una domanda di autorizzazione a procedere in giudizio nei confronti del deputato Giorgio Ferrari per violazione delle norme sulla disciplina igienica della produzione e vendita di sostanze alimentari e bevande, nonché per commercio colposo di sostanze alimentari nocive alla salute pubblica.

La vicenda trae origine dalla denuncia sporta dal responsabile del settore igiene pubblica della USL n. 21 della regione Veneto, a seguito di alcuni accertamenti sanitari effettuati su un campione di pane toscano risultato avariato e che, ingerito dal signor Del Santo, gli aveva provocato sintomi da avvelenamento.

Il signor Del Santo dichiarava in un primo momento all'ufficio d'igiene di aver acquistato il pane presso un supermercato della società PAM, ma successivamente smentiva per telefono tale affermazione, precisando appunto di aver acquistato il pane presso altro negozio, il tutto come risulta dagli atti in calce alla richiesta di analisi dell'ispettore capo dell'ufficio di igiene.

Nonostante la rettifica, il pretore di Padova citava a giudizio l'onorevole Giorgio Ferrari, nella sua qualità di legale rappresentante della società PAM s.p.a., rinviando poi il dibattimento a nuovo ruolo per richiedere la prescritta autorizzazione a procedere, essendo risultato che l'onorevole Giorgio Ferrari è deputato al Parlamento.

La Giunta ha esaminato la domanda di autorizzazione a procedere nella seduta del 27 marzo 1985 ed ha proceduto anzitutto all'audizione – ai sensi dell'articolo 18 del regolamento – del deputato Giorgio Ferrari.

Questi, dopo aver ricordato di essere presidente del consiglio di amministrazione e legale rappresentante della società PAM a titolo professionale, senza detenerne le azioni, ha confermato la totale estraneità della società medesima alla vicenda, come dichiarato dallo stesso denunciante.

Inoltre, date le dimensioni della società PAM, in alcun modo potrebbe essere ritenuto responsabile dei reati possibilmente commessi presso i singoli punti di vendita, per ciascuno dei quali, comunque, esiste un responsabile legale *ad hoc*. Questa situazione per altro è stata riconosciuta anche da una recente sentenza pronunziata in analogo processo a suo carico. Ha quindi, il Ferrari, lamentato le inutili ed erronee incriminazioni che per tale sua attività professionale lo vedrebbero coinvolto in numerose domande di autorizzazione a procedere.

La Giunta ha rilevato anzitutto che, nel caso di specie, dagli stessi atti processuali emerge l'erronea contestazione dei reati di cui ai capi d'imputazione, al legale rappresentante della società PAM, proprio per la rettifica effettuata dallo stesso denunziante che, scagionando tale società, fornisce la prova della sua estraneità alla vicenda.

In secondo luogo, la stessa impostazione aziendale di una società delle dimensioni della PAM esclude che la responsabilità penale per reati, come quelli in questione, possa farsi risalire al presidente del consiglio di amministrazione e legale rappresentante, onorevole Giorgio Ferrari, ma semmai ai dirigenti preposti ai singoli punti di vendita (oltre quattrocento), cui è stata delegata la responsabilità per il loro corretto funzionamento.

Il giudice pertanto – ad avviso della Giunta – avrebbe potuto evitare di promuovere il procedimento penale a carico dell'onorevole Giorgio Ferrari, laddove chiaramente appaiono infondate le imputazioni mosse nei suoi confronti e quindi l'assenza di ogni sua responsabilità penale.

Per questi motivi la Giunta ha deliberato di proporre che l'autorizzazione a procedere in giudizio non sia concessa.

Silvestro FERRARI, *Relatore.*

Appendix C: Appendix to Chapter 4

C.1 Proof of Lemma 4.1

Proof. Let $\Delta_c^{\text{pec}}(\xi) = u_c(z_{lc,2}^{\text{pec}}) - u_c(z_{cr,2}^{\text{pec}})$, where

$$\Delta_c^{\text{pec}}(\xi) = \frac{\begin{array}{r}(z_c - z_r)^2[\phi(z_c - z_r - 2(\xi + z_r)) \\ - 2a(\phi+1)]^2 - (z_c - z_l)^2[2a(\phi+1) + \phi(z_c - z_r + 2(z_l - \xi)]^2\end{array}}{16a^2}.$$

Differentiating Δ_c with respect to ξ yields

$$\frac{\begin{array}{r}(1+\phi)\left(2z_c^2 - 2z_c(z_l + z_r) + z_l^2 + z_r^2\right) \\ + \phi(z_l - z_r)\left(z_c^2 + z_c(4\xi - 3(z_l + z_r)) + 2z_l^2 + z_l(z_r - 2\xi) + z_r(z_r - \xi)\right)\end{array}}{4a^2},$$

which is always negative. □

C.2 Proof of Lemma 4.2

Proof. Differentiating Δ_c with respect to z_r yields

$$\frac{\begin{array}{r}a(\phi+1)\phi(z_c^2 + z_c(-4\xi - 4z_l + 6z_r) - 2a^2(\phi+1)^2(z_c - z_r) + z_l^2 + 2z_l z_r - 6z_r^2 + z_c^3 - 2z_c z_l^2 \\ + \phi^2(-\xi(z_c^2 - 2z_r(3z_c + z_l) + z_l^2 + 6z_r^2) - 2z_c^2 z_r + 4z_c z_l z_r - 3z_c z_r^2 + 2\xi^2(z_r - z_c))\end{array}}{4a^2},$$

which is always positive. □

C.3 Proof of Lemma 4.3

Proof. Let $\Delta_c^{\mathrm{m}}(\psi) = u_c(z_{lc,2}^{\mathrm{m}}) - u_c(z_{cr,2}^{\mathrm{m}})$. For ease of exposition, let $a = 1$ and $z_c = 0$.[1] Then:

$$\begin{aligned}
\Delta_c^{\mathrm{m}}(\psi) =& \delta z_l^2 \left(\psi z_l(z_r\phi + 4) - 2\psi z_r^2\phi + 2\psi z_r(\phi + 1) + 8\right) + z_r^2(\phi(z_l - 2z_r + 2) + 2)^2 \\
&- \frac{1}{4}\delta z_l^2(\phi(2z_l - z_r + 2) + 2)^2 \left[\psi\left(\frac{1}{4}z_l(\phi(2z_l - z_r + 2) + 2) + z_r\right) + 2\right] \\
&+ z_l^2\left(-(\phi(2z_l - z_r + 2) + 2)^2\right) + 4\delta z_r^2\left[\psi\left(\frac{1}{4}z_l(\phi(2z_l - z_r + 2) + 2) + z_r\right) - 2\right] \\
&+ \delta z_r^2(\phi(z_l - 2z_r + 2) + 2)^2\left[\frac{1}{2} - \frac{1}{4}\psi\left(\frac{1}{4}z_r(\phi(z_l - 2z_r + 2) + 2) + z_l\right)\right].
\end{aligned}$$

Differentiating $\Delta_c^{\mathrm{m}}(\psi)$ with respect to ψ yields

$$\begin{aligned}
&- \frac{1}{4}z_l^3(\phi(2z_l - z_r + 2) + 2)^3 - z_l^2 z_r(\phi(2z_l - z_r + 2) + 2)^2 + 4z_l^2 z_r(\phi(z_l - 2z_r + 2) + 2) \\
&+ 16z_l^3 - z_l z_r^2(\phi(z_l - 2z_r + 2) + 2)^2 + 4z_l z_r^2(\phi(2z_l - z_r + 2) + 2) \\
&- \frac{1}{4}z_r^3(\phi(z_l - 2z_r + 2) + 2)^3 + 16z_r^3
\end{aligned}$$

which is always negative. □

[1] The result does not depend on C being located in the middle of the policy space. The expressions for general z_c are available upon request.

C.4 Proof of Lemma 4.4

Proof. Differentiating $\Delta_c^{\mathrm{m}}(\psi)$ with respect to z_r yields

$$
\begin{aligned}
&2z_l^2\left(4\delta\psi + 3\delta\psi z_l(z_l+1)^2\phi^3 + 2(z_l+1)\phi^2(\delta(\psi(z_l-2)+4)+8) + \phi(\delta(8-\psi z_l)+16)\right)\\
&- 3z_r^2\big(-28\delta\psi + \delta\psi\left(3z_l^2+6z_l+4\right)\phi^3 + \phi^2\left(4\delta(3\psi+8) - 3\delta\psi z_l^2 - 4z_l(\delta(\psi-4)-8)+64\right)\\
&+ \phi(\delta(32-2\psi(z_l-6))+64)\big) + z_r\big(2\delta\big(-3\psi z_l^3(z_l+1)\phi^3 + \phi^2(3\psi z_l^3 - 8(\psi-2)z_l\\
&+ 16) + 8(\psi z_l - 6) + 16(z_l+2)\phi\big) + 64(\phi+1)(z_l\phi+\phi+1)\big) + 24\delta\psi z_r^5\phi^3\\
&- 30\delta\psi z_r^4\phi^2((z_l+2)\phi+2) + 4z_r^3\phi\left(12\delta\psi + 3\delta\psi(z_l+2)^2\phi^2 + 4\phi(\delta(\psi(z_l+6)+4)+8)\right),
\end{aligned}
$$

which is always positive. □

C.5 Proof of Proposition 4.2

Proof. The proof proceeds as follows. First, I show that the difference $U_{c,lc}^m - U_{c,lc}^{\mathrm{pec}}$ is *decreasing* in ψ: that is, as volatility decreases (ψ increases), C prefers a coalition to a merger with the closest party L.

Next, I consider the following equilibrium candidate: C proposes a PEC to L for $\psi > \hat{\psi}$, where $\hat{\psi}$ solves $U_{c,lc}^m = U_{c,lc}^{\mathrm{pec}}$, and show that this is incentive compatible for L. Then, I verify that a merger with L is incentive-compatible for L when $\psi < \hat{\psi}$.

Finally, I derive $\tilde{\psi}$, defined as the value of ψ such that $U_{c,cr}^m = U_{c,lc}^m$. Because of Lemma 4.3, we have $U_{c,cr}^m > U_{c,lc}^m$ for $\psi < \tilde{\psi}$. Then, I verify that a merger is incentive-compatible for R for this range of electoral volatility.

For ease of exposition, let $a = 1$ and z_c be located at the center of the policy space: $z_c = 0$ (these assumption only simplify the following expressions but are without loss of generality). From the expression of $U_{c,lc}^m$ (4.14), it is straightforward to compute the

following derivative:

$$\begin{aligned}\frac{\partial U^m_{c,lc}}{\partial \psi} &= \frac{1}{4}(z^m_{lc,1} + z_r)\left[u_c(z^m_{lc,1}) - u_c(z_r)\right] \\ &= \frac{1}{4}\left[\frac{1}{4}z_l(\phi(2z_l - z_r + 2) + 2) + z_r\right]\left[z_r^2 - \frac{1}{16}z_l^2(\phi(2z_l - z_r + 2) + 2)^2\right]. \end{aligned} \tag{C.1}$$

Subtracting $\partial U^{\text{pec}}_{c,lc}/\partial\psi$ from Equation C.1 produces

$$\begin{aligned}&\frac{8\phi\left(4z_l^2(z_l+1) + (4-3z_l)z_r^2 + z_l(3z_l+8)z_r - 4z_r^3\right)}{\psi^2(z_l\phi+4)(z_r\phi-4)} \\ &\frac{+\,4\phi\left(z_l^2z_r^2\phi^3(-3z_l+3z_r-4) + 4z_lz_r\phi^2\left(z_l^2 + z_l(2-3z_r) + (z_r-2)z_r\right) + 32(z_l+z_r)^2\right)}{\psi^2(z_l\phi+4)(z_r\phi-4)} \\ &+\frac{3z_l^2(\phi(2z_l - z_r + 2) + 2)^2\left(z_lz_r\phi^2(3z_l - 3z_r + 4) + 8(z_l+z_r) + 8z_l(z_l+1)\phi\right)}{\phi(z_l - z_r)(z_l\phi+4)} \\ &+\frac{48z_l^2(z_r\phi(z_l - 2z_r + 2) + 2(2z_l + z_r))}{z_r\phi - 4} + \frac{48z_r^2(z_l(\phi(2z_l - z_r + 2) + 2) + 4z_r)}{z_l\phi + 4} - \frac{16z_r^2\phi^2}{\psi^3} \\ &+\frac{3z_r^2(\phi(z_l - 2z_r + 2) + 2)^2\left(z_lz_r\phi^2(-3z_l + 3z_r - 4) + 8(z_l+z_r) + 4z_l(z_l+2)\phi\right)}{\phi(z_l - z_r)(z_r\phi - 4)},\end{aligned} \tag{C.2}$$

which under the assumptions is always negative.

Let $\hat{\psi}$ be the value of ψ such that $U^m_{c,lc} = U^{\text{pec}}_{c,lc}$ (the expression for $\hat{\psi}$ is lengthy therefore omitted). It follows from Equation C.2 that for $\psi > \hat{\psi}$, $U^{\text{pec}}_{c,lc} > U^m_{c,lc}$. Suppose that for this range of volatility C proposes a PEC to L. L accepts because $U^{\text{pec}}_{l,lc} > U^m_{l,lc}$ for, since L is closer to C than R is and has an electoral advantage. Hence, for $\psi > \hat{\psi}$, in equilibrium a PEC between C and L forms in $t = 1$.

For $\psi < \hat{\psi}$, C prefers to form a merger with L. Suppose that C proposes a PEC to L. If L accepts, its expected payoff is $U^m_{l,lc}$. If L rejects, the outcome depends on C's ranking of alternatives, which varies with ψ. That is, if $U^m_{c,lc} > U^{\text{pec}}_{c,lc} > U^m_{c,cr}$, knowing C's ranking L rejects the proposal, and in equilibrium a merger between C and L (i.e., L's preferred

option) forms. If instead $U^m_{c,lc} > U^m_{c,cr} > U^{\text{pec}}_{c,lc}$, L knows that a merger between R and C (its least preferred option) would form following a rejection. In the latter case, L accepts C's offer and a merger between C and L forms.

We are left to check whether a merger between C and R can form for some ψ. Let $\tilde{\psi}$ be the value of ψ such that $U^m_{c,lc} = U^m_{c,cr}$. Solving for ψ produces

$$\tilde{\psi} = \frac{\begin{array}{c}(z_l^2 + \delta z_l^2(\phi(2z_l - z_r + 2) + 2 - 16\delta)^2 + 2z_l^2(\phi(2z_l - z_r + 2) + 2)^2 \\ - \delta z_r^2(\phi(z_l - 2z_r + 2) + 2)^2 - 2z_r^2(\phi(z_l - 2z_r + 2) + 2)^2 + 16\delta z_r^2\big)\end{array}}{\begin{array}{l}\delta\big(4z_l^3(z_r\phi + 4) - 8z_l^2 z_r^2\phi + 8z_l^2 z_r(\phi + 1) - z_l^2(\phi(2z_l - z_r + 2) + 2)^2\big(\frac{1}{4}z_l(\phi(2z_l - z_r + 2)\big) \\ \quad + 16z_r^2\big(\frac{1}{4}z_l(\phi(2z_l - z_r + 2) + 2) + z_r\big) - z_r^2(\phi(z_l - 2z_r + 2) + 2)^2\big(\frac{1}{4}z_r(\phi(z_l - 2z_r + 2))\big)\big)\end{array}}.$$

It follows from Lemma 4.3 that $U^m_{c,cr} > U^m_{c,lc}$ for $\psi < \tilde{\psi}$.

Finally, let us analyze the incentive compatibility constraint of party R. It is easy to verify that R always accept a merger proposal from C, since the difference We can express the difference as

$$\begin{aligned}U^m_{r,cr} - U^m_{r,lc} = {} & \frac{z_r^2(\phi(z_l - 2z_r + 2) - 2)^2(\psi z_l(z_r\phi + 4) + 2\psi z_r(-z_r\phi + \phi + 1) - 8)}{256} \\ & - \frac{z_r^2(\phi(z_l - 2z_r + 2) - 2)^2}{16} \\ & + \frac{\delta(z_l(\phi(2z_l - z_r + 2) + 2) - 4z_r)^2(\psi z_l(\phi(2z_l - z_r + 2) + 2 + 4\psi z_r + 8))}{256} \\ & - \frac{1}{4}(z_l - z_r)^2\left[\psi\big(\frac{1}{4}z_r(\phi(z_l - 2z_r + 2) + 2) + z_l\big) + 2\right] \\ & + \left(\frac{1}{4}z_l(\phi(-2z_l + z_r - 2) - 2) + z_r\right)^2\end{aligned}$$

which under the assumptions is always positive. This in turn implies, from the previous step of the proof, that in equilibrium a merger between C and R forms for $\psi < \tilde{\psi}$ and a PEC between C and L forms for $\psi > \hat{\psi}$. When $\tilde{\psi} < \psi < \hat{\psi}$, a merger between C and L forms when $U^m_{c,lc} > U^{\text{pec}}_{c,lc} > U^m_{c,cr}$, and a PEC between C and L forms when $U^m_{c,lc} > U^m_{c,cr} > U^{\text{pec}}_{c,lc}$, which completes the proof. □

C.6 Proof of Remark 4.1

Proof. Let $z_r = -z_l + \kappa$, where $\kappa > 0$. The proof simply follows from differentiating Equation C.1 with respect to κ, which is always negative for $\kappa > 0$. □

C.7 Proof of Proposition 4.3

Proof. Denote by $U_i(\neg m_1)$ party i's second period expected payoff if parties do not merge in $t = 1$. Because of the parliamentary-mean assumption over the implemented policy, this is, for party C:

$$\begin{aligned} U_c(\neg m_1) &= \int_{-1/\psi}^{1/\psi} u_c \left(V_{l,2} z_l + V_{c,2} z_c + V_{r,2} z_r +\right) \frac{\psi}{2} d\xi \\ &= -\frac{3\left(2a(-2z_c + z_l + z_r) + z_l^2 - z_r^2\right)^2}{48a^2} + \frac{(z_l - z_r)^2}{12(a\psi)^2}, \end{aligned} \tag{C.3}$$

and analogously for parties L and R. Party C compares $U_c(\neg m_1)$ with $U_{i,2}(m_{lc,1})$ and $U_{i,2}(m_{cr,1})$ in the first period, when deciding whether to propose a merger to any party.

Let $\Delta_i^{lc,2} = U_{i,2}(m_{lc,1}) - U_i(\neg m_1)$. Differentiating with respect to ψ yields:

$$\frac{\partial \Delta_c^{lc,2}}{\partial \psi} = \frac{\begin{array}{c}(z_c - z_l)\big(- 4a^2(\phi - 1)(z_c(-\phi) + z_c + z_l(\phi + 3) - 4z_r) \\ + 4a\phi(z_c + 2z_l - z_r)(z_c(\phi - 1) - z_l(\phi + 1) + 2z_r) + \phi^2(z_c - z_l)(z_c + 2z_l - z_r)^2\big)\end{array}}{96a^4\psi^3},$$

which is always negative under the assumptions. Furthermore, there exists a value $\hat{\psi}^{lc}$ such that $\Delta_c^{lc,2}(\hat{\psi}^{lc}) = 0$ (the expression is long therefore omitted). Hence, C prefers to merge with L for $\psi < \hat{\psi}^{lc}$, while it prefers the continuation value from a PEC for $\psi > \hat{\psi}^{lc}$.

Analogously, we have that $\partial \Delta_c^{cr,2}/\partial \psi < 0$ and that there exists $\hat{\psi}^{cr}$ such that $\Delta_c^{cr,2}(\hat{\psi}^{cr}) = 0$. Hence, C prefers to merge with R for $\psi < \hat{\psi}^{cr}$, while it prefers the continuation value

from a PEC for $\psi > \hat{\psi}^{cr}$.

It is left to show that a merger is not incentive compatible neither for L nor for R. For L, we have that

$$\begin{aligned}
\Delta_l^{lc,2} &= \frac{1}{48}(z_l - z_r)^2\left(3z_l^2 + 6z_l(z_r - 2) + 3z_r^2 - 12z_r + 16\right) \\
&- \frac{1}{(\phi(z_c - z_l)(z_c + 2z_l - z_r) - 2(z_c(-\phi) + z_c + z_l\phi + z_l - 2z_r))}\Big[((\phi(z_c - z_l)(z_c + 2z_l - z_r) \\
&- 2(z_c(-\phi) + z_c + z_l\phi + z_l))(-(\phi(z_c - z_l)(z_c + 2z_l - z_r)) \\
&+ 2(z_c(-\phi) + z_c + z_l\phi + z_l + 2z_r + 4) + 8) \\
&- 4z_r(\phi(z_c - z_l)(z_c + 2z_l - z_r) - 2((1 - \phi)z_c + (1 + \phi)z_l + 2z_r) + 8) + 64z_l)^3 \\
&- ((\phi(z_c - z_l)(z_c + 2z_l - z_r) - 2((1 - \phi)z_c + z_l\phi + z_l))(-(\phi(z_c - z_l)(z_c + 2z_l - z_r)) \\
&- 2((1 - \phi)z_c + (1 + \phi)z_l + 2z_r - 4) + 8) + 64z_l)^3 \\
&+ 2(z_c(-\phi) + z_c + z_l\phi + z_l + 2z_r - 4) + 8) - 4z_r(\phi(z_c - z_l)(z_c + 2z_l - z_r)\Big],
\end{aligned}$$

which is always negative under the assumptions. It follows that L rejects a merger proposal by C. Similarly, $\Delta_r^{cr,2} < 0$, and R rejects a merger proposal by C.

Since mergers are always dominated for both L and R, in equilibrium no alliance forms in $t = 1$, and the unique equilibrium for all parameter values is that all parties run alone.

□

C.8 Proof of Proposition 4.4

Proof. The analysis of $t = 2$ is analogous to the baseline model. First, suppose that no merger formed in $t = 1$. Because $\sigma_m^2 > \sigma^2$, mergers are dominated in the second period, and both voters' and parties' decision are identical to the baseline model.

Suppose instead that a merger between C and R formed in $t = 1$. By assumption, the merger persists and faces party L. Notice that the probability that the merged party gets

the majority in $t = 2$ is $\Pr\{\xi > \tilde{\xi}_r\} = 1 - F(\tilde{\xi}_r)$ (the same as in the baseline), because the informational cost is only paid by voters in $t = 1$ when the merger is formed. Hence, the expected second period payoff from merging (4.14) is the same as in the baseline model.

In $t = 1$, policy uncertainty introduced by mergers changes how vote shares are computed. Let $v^m_{l,cr,2}$ denote the voter who is indifferent between voting for party L and for a merger among C and R. Formally, $v^m_{l,cr,2}$ solves

$$-\left(v^m_{l,cr,2} - z^m_{cr,2}\right)^2 - \sigma^2 - \frac{z_c - z_r}{\gamma} = -\left(v^m_{l,cr,2} - z_{l,2}\right)^2 - \sigma^2. \tag{C.4}$$

Solving for the indifferent voter yields:

$$v^m_{l,cr,2} = -\frac{\begin{array}{c}4a^2\left(\gamma z_c^2(\phi-1)^2 - 2z_c\left(\gamma z_r\left(\phi^2-1\right)+2\right) - 4\gamma z_l^2 + \gamma z_r^2(\phi+1)^2 + 4z_r\right) - \\ 4\gamma a\phi(z_c - z_r)(z_c - z_l + 2z_r)(z_c(\phi-1) - z_r(\phi+1)) + \gamma\phi^2(z_c - z_r)^2(z_c - z_l + 2z_r)^2\end{array}}{8a\gamma(2a(z_c(\phi-1) + 2z_l - z_r(\phi+1)) - \phi(z_c - z_r)(z_c - z_l + 2z_r))}. \tag{C.5}$$

Using this expression, it is straightforward to compute the vote share of the merged party in $t = 1$:

$$\begin{aligned}V^m_{cr,1} = \frac{1}{2} &+ \frac{(z_r - z_c)}{\gamma(\phi(z_c - z_r)(2a - z_c + z_l - 2z_r) - 2a(z_c - 2z_l + z_r))} \\ &- \frac{z_c + 2z_l + z_r}{8a} + \frac{\phi(z_c - z_r)(2a - z_c + z_l - 2z_r)}{16a^2}\end{aligned}$$

Differentiating $V^m_{cr,1}$ with respect to γ yields

$$\frac{z_c - z_r}{\gamma^2(2a(z_c(\phi-1) + 2z_l - z_r(\phi+1)) - \phi(z_c - z_r)(z_c - z_l + 2z_r))}, \tag{C.6}$$

which is always positive: as γ increases, the uncertainty paid by voter is reduced and the vote share of the merger increases.

Finally, we check if there exists a positive γ such that $V^m_{cr,1} = 1/2$. Solving for γ yields

$$\hat{\gamma} = \frac{16a^2(z_c - z_r)}{4a^2((z_c + z_r)^2 - 4z_l^2) + \phi^2(z_c - z_r)^2(2a - z_c + z_l - 2z_r)^2 - 4a\phi(z_c^2 - z_r^2)}, \tag{C.7}$$

which is a positive real root. It follows that for $\gamma > \hat{\gamma}$, $V^m_{cr,1} > 1/2$ and the analysis is analogous to the proof of Proposition 4.2. In particular, let $\Delta_{c,cr} \equiv U^m_{c,cr} - U^{\text{pec}}_{c,lc}$, where

$$U^m_{c,cr} = -(z^m_{cr,1} - z_c)^2 - \sigma^2 - \frac{|z_c - z_r|}{\gamma} + \delta U_{i,2}(m_{cr}),$$

and

$$U^{\text{pec}}_{c,lc} = -(z^{\text{pec}}_{lc,1} - z_c)^2 - \sigma^2 + \delta U_{i,2}(\neg m).$$

Because uncertainty only affects $\Delta_{c,cr}$ via the term $\frac{|z_c - z_r|}{\gamma}$, it follows that $\partial(U^m_{c,cr} - U^{\text{pec}}_{c,lc})/\partial\psi$ is always negative, analogously to Equation C.2. Furthermore, for γ big enough, there exists a value of ψ such that $U^m_{c,cr} = U^{\text{pec}}_{c,lc}$, and the result in Proposition 4.2 continues to hold.

It is left to show that for γ small enough no mergers are sustainable in equilibrium. When $\gamma < \hat{\gamma}$, $V^m_{cr,1} < 1/2$. In this case we have

$$U^m_{c,cr} = -(z^m_{cr,1} - z_c)^2 - \sigma^2 - \frac{|z_c - z_r|}{\gamma} + \delta U_{i,2}(m_{cr}),$$

Notice that $U^m_{i,cr} \to -\infty$ as $\gamma \to 0$. This implies that there exists γ' small enough such that $\Delta_{c,cr}(\gamma') = 0$ has no solution. In particular, we have $U^{\text{pec}}_{c,lc}(\gamma') > U^m_{i,cr}(\gamma')$ for all ψ. The analysis for a merger between C and L is analogous therefore omitted. □